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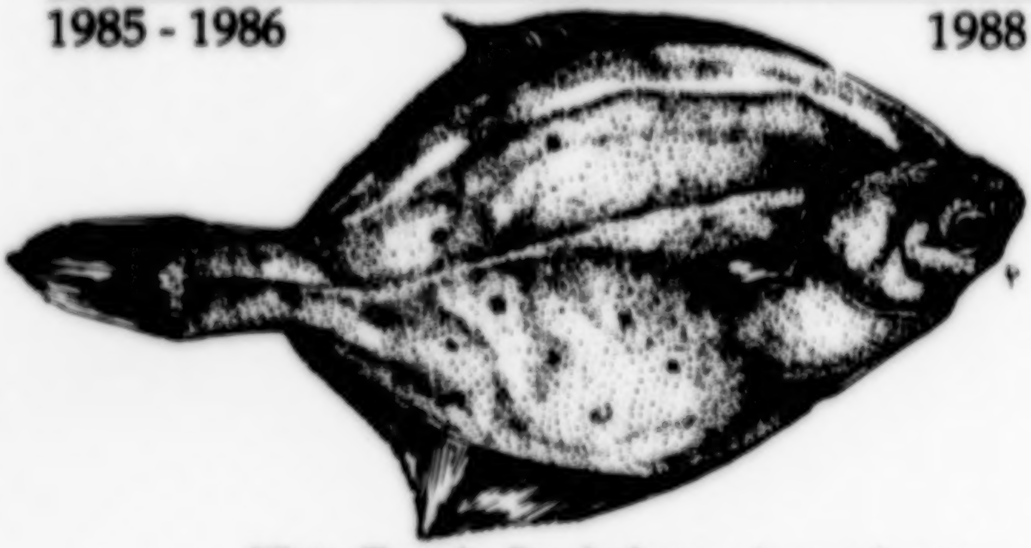
United States Department of the Interior
NATIONAL PARK SERVICE
Gateway National Recreation Area

JAMAICA BAY FISHERIES SURVEY

1985 - 1986 1988 - 1989



Winter Flounder ***Pseudopleuronectes americanus***

ny

Division of Natural Resources and Compliance

United States Department of the Interior
NATIONAL PARK SERVICE

Gateway National
Recreation Area

DIVISION OF NATURAL RESOURCES AND COMPLIANCE

JAMAICA BAY FISHERIES SURVEY
1985 - 1986
1988 - 1989

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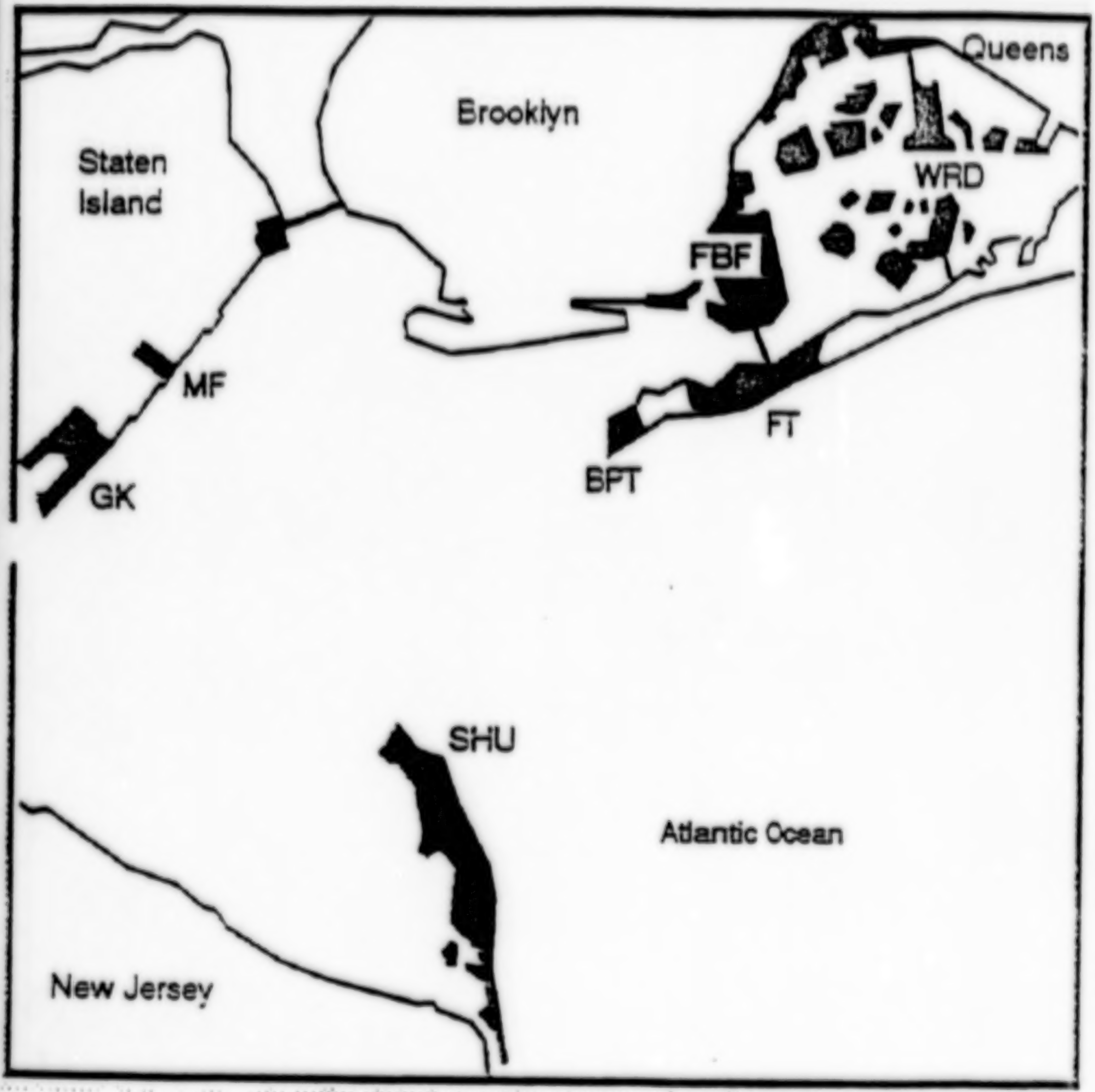

Gateway

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INTRODUCTION

The Jamaica Bay Fisheries Survey was initiated by the National Park Service in 1985 and coordinated with the U.S. Fish and Wildlife Service. Several other surveys have been conducted in the Bay in the last 15 years: Texas Instruments (1974) and the New York Aquarium (1983, 1985). The purpose of the survey by the National Park Service was to establish a reliable data base on finfish, their diversity, health and distribution. A variety of water quality parameters associated with finfish population collection sites were also collected.

SURVEY METHODOLOGY

A total of 81 species (Table I) were recorded using otter trawl, gill nets and beach seines. There were 15 otter trawl sample locations (Fig. 1), 8 gill net (Fig. 2) and 6 beach seine sites (Fig. 3) that comprised the study area. Each site was monitored for various water quality parameters including: temperature, dissolved oxygen, pH, salinity and conductivity. Otter trawl sites were also monitored for total and fecal coliform and chlorophyll a, and a number of fish were collected for analysis of bioaccumulation of contaminants.

The otter trawl is a cone shaped net that is towed through the water. Hydrodynamically stable otter boards spread the net open under the water, while weights hold the net on the bottom (Fig. 4). In this manner benthic fishes may be captured. The data for the trawl depths is listed on Table II. The fifteen trawling stations were chosen to reflect an overall geographic distribution as well as the varied sediment types found throughout the bay. The otter trawl was towed for five minutes into the tidal current.

Gill nets are walls of mesh set in the water. Gill net depths are listed in Table III. The gill nets were 100 feet long and had four 25 foot panels which provided mesh openings 1/2" to 2 1/2". The nets were held in place with 10 lb. anchors, marked with floats, and set perpendicular to the shoreline or shoal bank. They were retrieved after 24 hours. Fish swimming into the net become entangled (Fig. 5). Gill nets allow for the sampling of migratory, pelagic fishes.

The beach seine (Fig. 6) is a wall of mesh attached to two poles. The net is carried into the water chest height by two persons. It is then spread and pulled toward the shore. One sweep of a 50 foot net was made at each site per month. Beach seines trap juvenille species that hatch in the bay and forage fishes, small fishes that are prey for larger piscivorous fish.

Fish taken at each sample location were counted, measured, noted for breeding activity and evidence of disease. Temperature, dissolved oxygen, and pH were taken by probe, Hydrolab Digital 4001. Salinity and conductivity were measured by a Beckman Salinometer. Water samples were collected in sterile bottles for membrane filter analysis of total and fecal coliform. Chlorophyll-a was analyzed using both the fluorometric and spectrophotometric methods. Fish collected at various sites were wrapped in aluminum foil and frozen to be extracted for contaminants using the soxhlet extraction method.

WATER QUALITY PARAMETERS

Temperature

The most important physical information about a body of water is temperature. The temperature profoundly influences the lives of all marine plants and animals. Plants and most marine animals, except mammals, assume the same or almost the same temperature as the water. These plants and animals are adapted to a normal seasonal temperature regime and are commonly affected adversely by unusual temperatures (Royce, 1984). Many animals reproduce, feed or migrate only within certain temperature ranges. Temperature data for otter trawls, gill nets and beach seines are listed on Tables V thru VI.

The temperature of the open ocean varies from 0° to 20° C at the surface. Radiation from the sun warms waters in only a thin surface layer; 20 m in clear ocean water and 4 m in coastal waters, like those of Jamaica Bay. Waters below this level are heated by mixing with the surface layer. At the bottom of the mixed layer is a thermocline, a layer in which temperature changes rapidly with depth. Waters that are below the thermocline are of a more constant temperature. The seasonal variations in temperature are related to the size of Jamaica Bay and its proximity to land. The closer to land a body of water is, the more variation there will be in temperature (Royce 1984). Seasonal average temperatures are shown on Figures 7-9.

The striking differences between winter and summer fish faunas are due in large part to the temperature tolerances and preferences of different species. Graphs (Figs. 10 and 11) show the catch percentage of six different species by gill net and four different species by trawl net and their relationship to water temperature.

Dissolved Oxygen

Dissolved oxygen is a common measurement of biological significance. Oxygen is essential to almost all life, therefore its shortage or absence may limit the distribution of plants and animals. Some species of fish may be distressed in warm water with concentrations of oxygen less than 5mg/l; at lower temperatures some species may tolerate concentrations of less than 1 mg/l. Unlike atmospheric oxygen, which occurs at a nearly constant proportion, dissolved oxygen in water varies from none to twice the saturation point.

Oxygen dissolved in the water is a function of barometric pressure, temperature, salinity and proportion of oxygen in the air. Temperature and salinity cause the greatest variables in the amount of oxygen.

Oxygen levels are usually high in estuaries because of the constant inflow and mixing of both freshwater and salt water, although the naturally high levels of organic matter may reduce oxygen levels during times of low flow. Suspended organic and inorganic materials from runoff during heavy rains, CSO's and sewage treatment plants also affect oxygen levels in the bay. Figures 12 and 13 give graphic representation of six species captured by gill net and four species captured by otter trawl and their relationship to dissolved oxygen. Tables VII thru IX depict dissolved oxygen values for each site by each method in Jamaica Bay. Figures 14-16 show seasonal average dissolved oxygen at each method site.

Oxygen in water comes from the air by solution at the water's surface; some comes from photosynthesis via phytoplankton. It is removed by the respiration of plants, animals and bacteria. Transference from supersaturated surface layers puts oxygen back into the atmosphere and chemical reactions, especially organic decomposition, deplete levels of oxygen in the water. Due to low levels of oxygen in a particular area fish may not enter that area, or will migrate within an area as a response to changing levels in oxygen (Arthur, 1971).

Salinity

Salinity is the total amount of solid material in grams/Kg. of seawater when the carbonate has been converted to oxide, the bromine and iodine replaced by chlorine and the organic material completely oxidized. Seawater is a mixture of constant proportions of the halide, carbonate and sulfate salts of sodium, magnesium, calcium, potassium and strontium, together with small quantities of other substances and minute traces of other elements.

Normally, in an estuary such as Jamaica Bay, salinity exercises a strong influence over the distribution of fish. The intermediate and fluctuating salinities helps to keep the number of species down. However, 81 species have been captured in Jamaica Bay, but many of them are of insignificant numbers to be regarded as important (Figs. 17, 18, 19, 20, and 21). These flutuating salinities prevent stenohaline (able to tolerate only narrow ranges of salinities) fishes and freshwater fishes from penetrating far into the estuary. Menhaden prefer warm temperatures and high salinities as adults (Livingston, et. al., 1975) while young menhaden prefer warm water temperatures and low salinities (Copeland and Bechtel, 1974). Members of the Drum Family (Sciaenidae) also prefer high salinities. Weakfish and spot were both trapped by gill nets when salinities were higher than average.

Salinity is most critical to juvenile fishes dependent on the estuary for this stage in their life cycle. Sudden drops in salinity caused by heavy rainfall or increases in freshwater by runoff may force young fish from their normal feeding grounds, the bay fringes, into deeper, less productive, more saline water. There they may succumb either by osmotic shock, starvation or become prey for larger more aggressive fishes.

The salinity of the open ocean varies from only about 33% to 37%, because of different evaporation and rainfall amounts. In estuaries the effect of evaporation and rainfall are much greater. Salinity varies from site to site because of depth, location in the estuary, tide level, and seasonal changes in temperature. Tables X thru XII indicate salinites for each sample site by each method. Figures 22 and 23 reflect percentage catches with salinity as a varible, while Figures 24 and 25 are the comparisons of salinity over the years of study (salinities are averages by month).

pH

pH is one of the most physiologically significant factors affecting the distribution of fishes. Blood oxygen affinity, which is the capacity of blood to drive oxygen from hemoglobin into surrounding tissues, is critical to the survival of active fishes that must meet the demands of red muscle tissue used in swimming. Low pH is also a factor in the oxygen carrying capacity of blood hemoglobin (Root, 1931). The ability of fish to carry adequate amounts of oxygen in their blood make swimbladder inflation at depths possible (Baines, 1975). Other fishes that possesss no swimbladder, particularly the winter flounder, demonstrate a significant need for oxygen. Most teleosts depend on vision to feed, winter flounder possess a choroid rete or countercurrent vascular organ behind the eye (Wittenberg and Haedrich, 1974). This organ requires high oxygen levels to function properly, thus pH becomes a factor in teleost visual capabilities (Hayden et al., 1975).

The pH of the open sea remains between 8.1 and 8.3 in the surface layer. At the depth of minimum oxygen, pH may be as low as 7.5; in areas where there are pockets, pH may be as low as 7.0. Values outside the range of 4.5 to 10 are detrimental to fish.

The pH readings obtained from Jamaica Bay fall well within the ranges of normal pH, and do not seem to pose a problem for fish in the bay (Tables XIII-XV, Figures 27-29).

Chlorophyll-a

Chlorophyll-a is a common indicator of phytoplankton biomass. Phytoplankton are microscopic, unicellular algae which contribute oxygen and function as a food source for marine zooplankton, thus they are an integral part of the estuarine food web.

Phytoplankton have long been used as indicators of water quality (Palmer, 1969). Some species flourish in highly eutrophic waters, while others display sensitivity to organic and/or chemical wastes. Some species are associated with noxious blooms which may cause offensive odors or tastes, and some may produce toxic conditions.

Plankton respond quickly to environmental changes because of their short life span. They exert an influence on water pH, color, taste, and odor.

In order to flourish, plankton have their own environmental criteria. Light of the right intensity is vital to phytoplankton, as are sufficient quantities of nutrients including vitamin B-12, biotin, carbon dioxide, and a variety of minerals in specific concentrations (Vineyard, 1979). Temperature variations also influence algal biomass.

Chlorophyll-a values indicate an overall decrease from June 1988 to October 1989. One factor that may account for this is the exceptional amount of rainfall in 1989 and, therefore, increased cloud cover, altering light intensity patterns. Another factor is that 1988 determinations of chlorophyll-a were done using the flourometric method, while 1989 results were obtained using the spectrophotometric method. The spectrophotometric method can underestimate chlorophyll-a concentrations by as much as 40% (Riemann, 1978). Chlorophyll-a results are shown on Tables XVI and XVII; Figure 30 represents the monthly averages of chlorophyll a in the bay.

Total and Fecal Coliform

Coliforms are indicator species, or microorganisms whose densities can be related quantitatively to swimming associated health hazards. The concern is with infectious, enteric diseases, such as cholera and typhoid fever, whose etiological agents are excreted in feces and are spread by water and food contaminated with fecal wastes (Cabelli, 1983).

Several studies have shown a correlation between epidemiological health effects in swimmers and total and fecal coliform counts in recreational bathing waters (Stevenson, 1953, Cabelle et al., 1983 and Roseberg, 1976). Current measurements more specific to particular groups of coliform bacteria (Enterococci, in particular) are better indicators of swimming related illness (Cabelli, et al., 1983). Total coliform counts of 2400/100ml of sample and fecal counts of 200/100ml of sample, however, remain the respective New York State and Federal limits.

While the relationship between swimming in polluted waters and disease has long been documented, very little research has been done showing the relationship between finfish and high coliform counts.

Coliform bacteria inhabit the gastrointestinal tract of warm blooded animals and the waste waters associated with their effluents. Since fish are cold blooded, it is highly unlikely that bacterial infections associated with the coliform group be transmitted by eating fish provided proper handling, storage and cooking methods are employed.

Shellfish pose another problem. Shellfish may be contaminated by polluted water and the degree of contamination is dependent on the degree of pollution. Since oysters, clams, and other shellfish are eaten raw, the potential for typhoid, paratyphoid fever, cholera, dysentary and hepatitis A always exists. Mussels subject to sewage pollution may give rise to gastrointestinal disturbances which sometimes end in paralysis and even death.

Tables XVIII and XIX give total and fecal coliform results from June 1988 to September 1989. Figure 31 shows quantities of fish caught at each trawl site and total and fecal coliform values. Figure 32 shows seasonal monthly averages for total and fecal coliforms. From this analysis, no correlation between numbers of finfish and total and fecal coliform values can be determined. Other variables play a more significant role in the distribution of finfish.

Conductivity

Conductivity is a numerical expression of the ability of an aqueous solution to carry an electric current. This ability depends on the presence of ions, their total concentrations, mobility, valence and relative concentrations. Conductivity is important in determining the inorganic content of the water, the effect of the total concentration of ions on chemical equilibria, the physiological effect on plants and animals, and the corrosion rate of the environment.

The conductivity for each otter trawl site from June 1988 to September 1989 is given on Table XX. Figures 33 shows seasonal monthly averages for conductivity. Figure 34 shows quantities of fish caught and the average conductivity for the years of study. No relationship between conductivity and numbers of fish can be established.

Fish Distribution and Conclusion

The fluctuating nature of the Bay means that the finfish must expend considerable amounts of energy adjusting to the changing conditions. These changes are either metabolic or consist of a search within the Bay of less stressful conditions. However, these same factors that influence energy costs are the same factors that cause high nutrient concentrations which support large populations of organisms. The nutrients most often associated with bays are the detritus from the breakdown of marshlands, phytoplankton, and sewage from treatment facilities. The activities of invertebrates play a major role in the retention of the nutrients within the Bay. Filter feeding zooplankton, particularly copepods, feed on the detritus and phytoplankton and, inturn, are preyed upon by fish. Fecal pellets from the zooplankton and fish drop to the bottom where they form a rich organic ooze that serves as food for benthic invertebrates.

Currents typically concentrate nutrients, zooplankton, and feeding fishes. However, this same process also tends to concentrate pollutants including pesticides, PCB's, and heavy metals.

Fish associated with the bays are generally classified as follows: (1) freshwater, (2) diadromous, (3) true estuarine, (4) non-dependent marine, and (5) dependent marine fishes.

Freshwater fish found in estuaries are only temporary residents washed in from up stream. Since Jamaica Bay is not fed by a major freshwater flow, freshwater species have not been documented in the Bay.

Diadromous fishes are saltwater dispersants who regularly move between freshwater and saltwater, spending different parts of their life cycles in each environment. Diadromous fishes found in Jamaica Bay are striped bass and American Shad.

The true estuarine fishes are those that spend their entire life cycle in the estuary. There are two species on the east coast that fall into this category: the white perch, which has been found in the bay, and the spotted seatrout, which has not.

Non-dependent marine fishes are those species found in estuaries, but do not require the estuarine environment to complete their life cycles. These species form an important part of the estuarine ecosystem, and are also important in shallow water marine environments, in general. The dominant species in the Bay, the winter flounder, falls into this category with the other members of the flounder family, as well as the sculpins and searobins.

Dependent marine fishes are those fishes that must spend part of their life cycle in the bay, either for spawning, nurseries for their young, or as feeding grounds for adults. Members of the herring family use estuaries for spawning. They attach their eggs to submerged plants or other objects. The advantage of this breeding stategy is that the young hatch close to a food source. This stategy applies to menhaden, shad, alewife, and all the herring.

Members of the cod family lay planktonic eggs; newly hatched fishes do not swim well and are also found in the plankton. The cod and their relatives, the hakes, prefer cooler waters and spend a short time in the bay feeding when temperatures are low before moving northward up the coast.

Most species of finfish captured in Jamaica Bay are juveniles of their species (Tables XXI to XXII) and are utilizing the Bay as a nursery before reaching sexual maturity and joining others of their kind on seasonal migrations. Of these species, the most significant captured by otter trawl is the winter flounder, a commercially and recreationally important fish. Trawls executed from November 1985 to October 1986 show that 44.7% of the total catch was winter flounder, and in trawls executed from June 1988 to October 1989, that percentage increased to 47.3% of the total catch by otter trawl. Figures 35-38 show the numbers of fish captured during the two different trawl times. Variations in these numbers, particularly with the cold water species, are due to the fact that less winter trawling was done during the 1988-89 season. Other species vary between one and five percentage points.

Among forage fishes captured by beach seine, Atlantic silversides remain the dominant species during both studies. The total percentage of Atlantic silversides rose 9.1% during the 1988-89 season. Striped killifish increased 1.9% while counts of Mummichogs remained the same. The significant feature of beach seines, however, is the obvious increase in the number of juvenile bluefish entering the Bay to feed. During the 1985-86 season, bluefish were counted in with other species that composed 3.4% of the total seine catch for that period. During the 1988-89 season, bluefish alone were 7.6% of the total seine catch.

There is no comparative data for the gill net sites. Gill nets are destructive. They kill fish and were abandoned during the 1988-89 season. However, the data for the one season reflects that Atlantic menhaden are the dominant adult species entering the Bay to feed on the rich diversity of plankton.

Jamaica Bay appears to be a significant nursery ground for many important species of recreational fish. It is also a important nursery for the commercially valued winter flounder. Investigations on how to enhance this resource should now be considered.

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TABLES AND FIGURES

Table I

List of Fish Species

Common Name	Scientific Name
Sand tiger	Odontaspis taurus
Smooth dogfish	Mustelis canis
Spiny dogfish	Squalus acanthias
Little Skate	Raja erinacea
Clearnose Skate	Raja eglanteria
Cownose ray	Rhinoptera bonasus
Atlantic stergeon	Acipenser oxyrhynchus
American eel	Anguilla rostrata
Conger eel	Conger oceanicus
Blueback herring	Alosa aestvalis
Alewife	Alosa pseudoharengus
American shad	Alosa sapidissima
Atlantic menhaden (bunker)	Brevoortia tyrannus
Atlantic herring	Clupea harengus
Bay anchovy	Anchoa mitchilli
Inshore lizardfish	Synodus foetens
Oyster toadfish	Opsanus tau
Atlantic cod	Gadus morhua
Atlantic tomcod	Microgadus tomcod
Silver hake	Merluccius bilinearis
Red hake (squirrel hake)	Urophycis chuss
Spotted hake	Urophycis regia
White hake	Urophycis tenuis
Halfbeak	Hyporhamphus unifasciatus
Atlantic needlefish	Strongylura marina
Mummichog	Fundulus heteroclitus
Banded killifish	Fundulus diaphanus
Striped killifish	Fundulus majalis
Spotfin killifish	Fundulus luciae
Inland silverside	Menidia beryllina
Atlantic silverside	Menidia menidia
Bluespotted coronetfish	Fistularia tabacaria
Fourspine stickleback	Apeltes quadracus
Threespine stickleback	Gasterosteus aculeatus
Lined seahorse	Hippocampus erectus
Northern pipefish	Syngnathus fuscus
White perch	Morone americana
Striped bass	Morone saxatilis
Black sea bass	Centropristis striata
Bigeye	Priacanthus arenatus
Short bigeye	Pristigenys alta
Bluefish	Pomatomus saltatrix

Table I

List of Fish Species

Common Name	Scientific Name
Cobia	Rachycentron canadum
African pompano (threadfin)	Alectis cilaris
Yellow jack	Caranx bartholomaei
Crevalle jack	Caranx hippos
Bigeyed scad	Selar crumenophthalmus
Lookdown	Selene vomer
Scup (porgy)	Stenotomus chrysops
Northern kingfish	Menticirrhus saxatilis
Spot (lafayette)	Leiostomus xanthurus
Weakfish	Cynoscion regalis
Spotfin butterflyfish	Chaetodon ocellatus
Tautog (blackfish)	Toutoga onitis
Cunner (bergall)	Tautogolabrus adspersus
Striped mullet	Mugil cephalus
White mullet	Mugil curema
Northern sennett	Sphyraena borealis
Northern stargazer	Astroscopus guttatus
Ocean pout	Macrozoarces americanus
American sand lance	Ammodytes hexapterus
Naked goby	Gobiosoma bosci
Seaboard goby	Gobiosoma ginsburgi
Butterfish	Peprilus triacanthus
Northern searobin	Pronotus carolinus
Striped searobin	Prionotus evolans
Grubby (sculpin)	Myoxocephalus aeneus
Longhorn sculpin	M. octodecimspinosus
Summer flounder (fluke)	Paralichthys dentata
Fourspot flounder	Paralichthys oblongus
Gulf stream flounder	Citharichthys arctifrons
Smallmouth flounder	Etropus microstomus
Windowpane	Scophthalmus aquosus
Winter flounder	Pseudopleuronectes americanus
Hogchoker	Trinectes maculatus

Table II
TRAWL DEPTHS FOR EACH OTTER TRAWL SAMPLE LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

Trawl Site	Depth
1	13.0 ft.
2	16.0 ft.
3	19.6 ft.
4	32.8 ft.
5	19.6 ft.
6	22.9 ft.
7	36.0 ft.
8	36.0 ft.
9	29.5 ft.
10	32.8 ft.
11	32.8 ft.
12	26.2 ft.
13	42.6 ft.
14	22.9 ft.
15	16.4 ft.

Table III
DEPTHS FOR EACH OTTER GILL NET LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Gill Net Site								
	1	2	3	4	5	6	7	8	9
Date									
11/85	9.0	5.0	7.0	4.0	3.0	7.0	7.0	4.0	8.0
12/85	8.0	7.0	7.0	5.0	5.0	5.0	5.0	8.0	8.0
3/86	8.0	7.0	6.0	7.0	4.0	8.0	8.0	4.0	5.0
4/86	7.0	8.0	8.0	7.0	4.0	4.0	8.0	6.0	7.0
5/86	8.0	7.0	6.0	6.0	4.0	8.0	6.0	4.0	6.0
6/86	4.0	8.0	7.0	7.0	6.0	3.0	7.0	5.0	5.0
8/86	6.0	7.0	6.0	7.0	3.0	10.0	8.0	5.0	6.0
9/86(e)	*	6.0	8.0	7.0	*	4.0	8.0	6.0	7.0
9/86(l)	7.0	4.0	8.0	6.0	4.0	10.0	7.0	4.0	6.0
10/86	6.0	7.0	6.0	7.0	4.0	8.0	8.0	5.0	7.0

*No Data
**No Sample
(e) = early
(l) = late

Table IV

TEMPERATURES (C) FOR EACH OTTER TRAWL SAMPLE LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Trawl Site														
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11/85	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12/85	3.0	2.8	2.2	1.6	1.8	2.2	1.8	1.4	1.1	1.1	1.0	0.7	0.3	0.7	1.0
3/86	4.6	4.6	4.9	4.2	5.3	5.6	6.2	5.8	5.6	6.0	4.8	6.2	5.1	5.8	4.3
4/86	8.4	8.8	9.0	8.3	8.9	10.0	9.0	10.4	10.3	11.2	10.4	10.3	10.2	9.6	9.6
5/86	14.3	14.2	16.2	16.5	17.0	17.6	17.6	18.3	18.2	18.1	17.7	17.7	17.6	17.6	17.4
6/86	16.3	16.2	16.8	17.5	18.6	18.6	18.4	18.6	20.7	20.0	20.5	20.2	19.6	20.6	20.2
8/86	22.6	22.4	22.8	23.9	24.2	24.9	24.7	25.3	25.5	25.3	24.0	25.4	25.4		25.6
9/86(e)	*	*	*	*	*	*	*	20.1	20.1	20.6	20.5	20.2	*	*	*
9/86(l)	18.0	18.0	18.1	17.8	18.8	18.4	18.4	18.1	17.8	18.1	17.9	18.2	18.6	18.4	18.3
10/86	13.3	13.6	13.2	13.3	12.9	12.7	12.5	11.7	13.5	13.0	13.6	13.1	13.4	12.6	13.6
6/88	18.5(s)	20.0(s) 17.2(b)	23.0(s) 21.0(b)	22.2(s) 20.0(b)	23.0(s) 20.5(b)	23.0(s) 22.0(b)	22.5(s)	23.0(s) 27.5(b)	23.0(s)	*	17.7(s)	22.2(s)	21.1(s)	21.1(s)	21.1(s)
7/88	20.4(s) 17.9(b)	20.5(s) 20.1(b)	22.3(s) 21.3(b)	23.4(s) 23.2(b)	25.5(s) 21.5(b)	24.5(s) 23.2(b)	24.6(s) 23.2(b)	27.0(s) 23.3(b)	25.1(s) 24.9(b)	25.2(s) 24.9(b)	25.3(s) 24.7(b)	25.5(s) 24.3(b)	26.0(s) 24.4(b)	24.0(s) 23.9(b)	23.8(s) 23.3(b)
8/88	21.1(s) 20.8(b)	21.0(s) 20.7(b)	20.8(s) 20.6(b)	21.6(s) 21.4(b)	*	*	*	*	*	*	*	*	22.9(s) 22.5(b)	*	*
9/88	17.4(s) 17.3(b)	18.0(s) 17.5(b)	17.8(s) 17.6(b)	19.1(s) 18.5(b)	18.2(s) 17.1(b)	18.2(s) 17.9(b)	18.1(s) 17.8(b)	18.2(s) 18.1(b)	19.5(s) 19.5(b)	19.5(s) 18.6(b)	20.1(s) 18.5(b)	19.2(s) 18.8(b)	19.7(s) 18.9(b)	19.3(s) 19.1(b)	19.0(s) 19.0(b)
10/88	12.7(s) 12.6(b)	12.4(s) 12.7(b)	12.4(s) 12.9(b)	12.7(s) 12.5(b)	12.8(s) 12.7(b)	11.0(s) 11.0(b)	10.8(s) 10.8(b)	10.7(s) 10.5(b)	10.9(s) 10.7(b)	10.7(s) 10.7(b)	**	10.8(s) 10.5(b)	10.6(s) 10.3(b)	10.7(s) 10.4(b)	**
11/88	8.4(s) 7.9(b)	*	*	*	*	7.6(s) 7.2(b)	7.7(s) 7.5(b)	**	**	**	**	8.0(s) 7.7(b)	**	8.2(s) 8.1(b)	**
12/88	**	**	**	*	*	*	*	**	**	**	**	**	**	**	**
1/89	**	**	**	*	*	**	**	**	**	**	**	**	**	**	**
2/89	**	**	**	**	*	*	**	**	**	**	**	**	**	**	**
3/89	**	**	**	**	*	**	**	**	**	**	**	**	**	**	**
5/89	12.9(s) 12.4(b)	**	14.9(s) 13.8(b)	15.7(s) 14.3(b)	16.2(s) 14.7(b)	**	**	**	**	**	**	**	**	17.1(s) 16.2(b)	**
6/89	18.1(s) 17.6(b)	18.2(s) 17.1(b)	19.5(s) 18.2(b)	20.3(s) 19.6(b)	**	21.3(s) 20.4(b)	22.1(s) 22.1(b)	22.1(s) 22.1(b)	22.4(s) 21.4(b)	22.6(s) 20.9(b)	**	22.9(s) 20.1(b)	23.6(s) 20.9(b)	21.3(s) 20.8(b)	22.4(s) 21.9(b)
7/89	22.2(s) 22.1(b)	22.0(s) 21.8(b)	22.1(s) 22.1(b)	22.3(s) 22.3(b)	23.0(s) 22.5(b)	**	23.7(s) 23.7(b)	23.9(s) 23.1(b)	24.0(s) 23.0(b)	**	25.2(s) 25.3(b)	25.1(s) 23.3(b)	24.4(s) 23.7(b)	23.9(s) 23.2(b)	23.3(s) 23.8(b)
8/89	21.5(s) 21.6(b)	21.6(s) 21.2(b)	22.4(s) 21.9(b)	23.1(s) 23.3(b)	23.2(s) 22.7(b)	23.3(s) 22.7(b)	23.2(s) 23.3(b)	23.7(s) 23.6(b)	24.1(s) 23.9(b)	24.6(s) 24.1(b)	24.4(s) 24.1(b)	24.6(s) 24.9(b)	24.2(s) 24.0(b)	23.9(s) 23.7(b)	23.9(s) 24.4(b)
9/89	22.5(s) 22.3(b)	22.7(s) 22.4(b)	22.9(s) 22.2(b)	22.5(s) 22.8(b)	23.5(s) 23.0(b)	23.5(s) 23.1(b)	23.5(s) 23.1(b)	23.2(s) 23.0(b)	**	**	23.7(s) 21.8(b)	23.7(s) 23.5(b)	21.8(s) 23.3(b)	23.8(s) 23.6(b)	23.7(s) 23.6(b)
10/89	**	**	**	**	**	*	*	*	**	**	**	**	**	**	**

* No Data

** No Trawl

--Single number indicates surface temperature

(s) - surface (e) - early

(b) - bottom (l) - late

Table V

TEMPERATURE (C) FOR EACH GILL NET LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

Gill Net Site

Date	1	2	3	4	5	6	7	8	9
11/85	*	*	*	*	*	*	*	*	*
12/85	3.2	.7	.6	.6	.8	.5	.2	.5	1.2
3/86	5.5	6.0	5.8	5.5	6.3	4.7	5.8	5.4	5.8
4/86	7.7	8.4	8.4	8.8	8.4	9.2	8.6	8.6	8.3
5/86	16.5	19.0	18.4	18.5	17.7	18.4	18.5	17.8	17.5
6/86	17.5	20.0	19.5	19.4	18.7	21.3	20.5	20.1	20.0
8/86	23.5	24.9	24.6	25.2	24.5	25.5	25.2	25.1	24.1
9/86(e)	*	19.6	19.6	20.1	*	20.3	20.0	19.7	19.5
9/86(1)	13.2	18.9	18.8	19.2	18.9	19.1	18.9	18.7	18.4
10/86	13.3	13.4	13.3	13.4	13.2	13.1	13.3	13.1	13.3

*No Data
**No Sample
(e) = early
(1) = late

Table VI

TEMPERATURES (C) FOR EACH SEINE SAMPLE LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Seine Site					
Date	1	2	3	4	5	6
11/85	**	**	**	**	**	**
12/85	2.5	3.3	2.3	1.8	1.2	**
3/86	6.3	6.9	7.7	5.7	5.6	4.3
4/86	9.6	8.8	9.9	9.2	8.7	9.2
5/86	13.7	17.8	15.8	18.2	17.7	20.3
6/86	19.5	18.7	20.5	21.1	21.0	19.1
8/86	24.6	23.9	25.1	25.8	26.1	24.5
9/86(e)	20.2	20.4	20.5	19.9	20.8	20.5
9/86(l)	20.3	19.5	19.9	20.6	20.5	23.3
10/86	15.5	15.1	15.8	15.3	14.6	13.7
6/88	*	23.3	25.0	25.0	**	*
7/88	**	**	**	**	**	**
8/88	*	*	*	*	*	*
9/88	17.1	18.0	18.5	18.4	19.2	22.0
10/88	11.4	12.1	11.6	15.6	14.2	12.9
4/89	11.3	12.9	13.0	**	**	13.5
6/89	22.5	24.1	22.9	22.3	21.4	24.4
7/89	25.1	25.2	26.5	25.5	26.2	27.7
8/89	22.0	24.1	24.6	18.6	21.0	20.8
9/89	*	*	*	**	**	**

*No Data
** No Seine

(e) = early
(l) = late

Site 1 = Breezy Point
Site 2 = DuBois Point
Site 3 = North Channel Bridge
Site 4 = Hangar B
Site 5 = Barren Island Marina
Site 6 = Plumb Beach

Table VII

DISSOLVED OXYGEN (mg/L) FOR EACH GILL NET LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Gill Net Site								
Date	1	2	3	4	5	6	7	8	9
11/85	*	*	*	*	*	*	*	*	*
12/85	*	*	*	*	*	*	*	*	*
3/86	11.1	11.6	11.5	10.7	11.4	9.6	10.8	10.8	11.2
4/86	*	*	*	*	*	*	*	*	*
5/86	8.9	12.8	10.2	8.5	9.4	9.9	10.9	8.3	9.4
6/86	6.6	9.1	9.1	6.1	7.2	7.9	6.0	7.4	7.2
8/86	4.9	4.6	4.4	3.7	4.5	2.6	3.8	4.5	3.8
9/86(e)	*	5.6	5.5	4.3	*	3.1	4.8	5.2	5.4
9/86(1)	*	3.5	3.1	3.5	*	4.3	*	*	*
10/86	5.3	3.9	3.7	3.5	5.3	5.5	4.4	4.5	4.9

*No Data
**No Sample
(e) = early
(1) = late

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Table VIII

DISSOLVED OXYGEN (mg/L) FOR EACH OTTER TRAWL SAMPLE LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Trawl Site														
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11/85	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12/85	10.2	9.8	10.8	11.5	12.0	12.4	11.5	12.4	11.8	11.7	11.7	11.3	11.3	11.7	11.6
3/86	9.2	10.2	10.8	10.1	10.9	11.4	12.4	11.7	11.1	10.6	10.9	11.5	10.8	11.4	10.2
4/86	8.6	8.6	8.3	8.9	8.4	8.6	*	8.5	8.3	9.0	7.6	8.7	7.4	7.9	7.9
5/86	8.5	8.9	8.2	8.9	8.6	8.5	7.5	7.6	7.7	7.6	10.3	9.6	8.6	7.8	8.6
6/86	6.3	6.6	6.4	6.7	7.3	7.7	6.8	6.3	4.6	3.0	3.7	4.9	4.0	6.4	5.7
8/86	4.8	4.8	4.9	4.2	3.9	5.3	3.6	4.0	3.5	1.5	2.2	3.2	3.8	7.2	4.5
9/86(e)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9/86(l)	*	*	*	*	*	*	*	*	1.1	*	*	*	2.4	*	*
10/86	5.4	5.6	5.4	5.5	4.5	4.9	4.5	1.7	4.6	3.8	2.3	3.9	3.4	2.9	4.7
6/88	10.0(s)	11.5(s) 8.0(b)	*	13.8(s) 11.5(b)	13.0(s) 8.2(b)	12.0(s) 12.0(b)	11.2(s)	15.0(s) 10.8(b)	*	*	*	*	*	*	*
7/88	9.2(s) 7.5(b)	8.5(s) 7.8(b)	9.0(s) 7.2(b)	8.5(s) 8.2(b)	11.8(s) 6.8(b)	10.2(s) 8.2(b)	9.7(s) 8.3(b)	10.1(s) 6.0(b)	8.6(s) 5.0(b)	9.6(s) 8.5(b)	10.4(s) 4.5(b)	13.3(s) 7.1(b)	12.6(s) 9.3(b)	9.6(s) 8.6(b)	10.8(s) 9.4(b)
8/88	13.4(s) 10.5(b)	10.5(s) 10.6(b)	9.1(s) 9.0(b)	11.6(s) 10.7(b)	*	*	*	*	*	*	*	*	*	*	*
9/88	8.4(s) 8.4(b)	8.1(s) 8.1(b)	7.8(s) 7.2(b)	8.6(s) 8.3(b)	9.5(s) 8.2(b)	9.6(s) 7.7(b)	8.5(s) 8.1(b)	8.8(s) 6.6(b)	7.3(s) 6.0(b)	8.6(s) 7.2(b)	9.0(s) 6.5(b)	8.2(s) 7.3(b)	7.0(s) 6.0(b)	7.2(s) 5.7(b)	8.8(s) 6.1(b)
10/88	*	*	*	*	9.8(s) 8.5(b)	9.9(s) 8.9(b)	9.5(s) 9.1(b)	9.3(s) 7.5(b)	8.3(s) 7.0(b)	8.9(s) 7.8(b)	**	9.2(s) 8.3(b)	8.0(s) 7.0(b)	8.2(s) 6.7(b)	**
11/88	6.6(s) 6.3(b)	**	**	**	**	*	*	**	**	**	**	7.0(s) 7.2(b)	**	6.3(s) 6.1(b)	**
12/88	**	**	**	*	14.6	13.0	13.2	**	**	**	**	**	**	**	**
1/89	**	**	**	*	16.4	**	**	**	**	**	18.0	**	**	**	**
2/89	**	**	**	**	14.2	*	**	**	**	**	**	**	**	**	**
3/89	**	**	**	**	18.6(s) 15.8(b)	**	**	**	**	**	**	**	**	**	**
5/89	10.8(s) 9.7(b)	**	8.7(s) 7.4(b)	9.6(s) 7.3(b)	9.6(s) 7.2(b)	**	**	**	**	**	**	**	**	10.9(s) 8.6(b)	**
6/89	*	*	*	*	**	*	*	*	*	*	**	*	*	*	*
7/89	6.8(s) 6.5(b)	7.8(s) 7.5(b)	5.3(s) 5.9(b)	5.0(s) 4.9(b)	4.4(s) 4.6(b)	*	4.2(s) 4.0(b)	4.0(s) 3.1(b)	2.7(s) 1.4(b)	**	4.5(s) 1.6(b)	3.2(s) 2.0(b)	3.4(s) 3.5(b)	4.2(s) 3.2(b)	4.2(s) 3.7(b)
8/89	7.1(s) 7.0(b)	7.8(s) 7.2(b)	8.4(s) 7.5(b)	8.2(s) 7.7(b)	9.2(s) 9.1(b)	10.5(s) 6.2(b)	8.9(s) 9.1(b)	9.3(s) 5.3(b)	5.7(s) 5.0(b)	6.9(s) 6.4(b)	11.1(s) 6.4(b)	9.1(s) 4.4(b)	7.7(s) 8.0(b)	11.6(s) 8.2(b)	9.9(s) 6.7(b)
9/89	6.5(s) 6.3(b)	6.9(s) 4.9(b)	6.2(s) 5.8(b)	7.3(s) 5.4(b)	7.5(s) 4.0(b)	6.8(s) 4.2(b)	6.5(s) 7.2(b)	7.5(s) 7.1(b)	**	**	7.7(s) 4.5(b)	5.1(s) 4.4(b)	6.1(s) 5.7(b)	7.8(s) 5.6(b)	7.8(s) 5.6(b)
10/89	**	**	**	**	**	*	*	*	**	**	**	**	**	**	**

*No Data

** No Trawl

--Single number indicates surface dissolved oxygen

(s) - surface (e) - early

(b) - bottom (l) - late

Table IX

DISSOLVED OXYGEN (mg/L) FOR EACH SEINE SAMPLE LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Seine Site					
Date	1	2	3	4	5	6
11/85	**	**	**	**	**	**
12/85	13.3	11.5	12.9	12.9	12.5	*
3/86	9.8	9.9	10.4	11.0	11.2	9.2
4/86	*	*	*	*	*	*
5/86	10.5	10.9	10.9	9.2	12.6	10.5
6/86	7.9	7.5	9.6	7.5	6.8	9.4
8/86	4.6	5.5	3.4	3.2	5.2	7.4
9/86(e)	*	*	*	*	*	*
9/86(l)	4.0	*	3.8	3.6	6.4	7.9
10/86	9.1	5.0	5.8	5.7	5.0	4.2
6/88	*	*	*	*	*	*
7/88	**	**	**	**	**	**
8/88	*	*	*	*	*	*
9/88	10.5	6.5	6.8	9.7	10.2	13.4
10/88	9.2	7.2	7.5	9.3	9.6	7.0
4/89	9.4	9.4	8.3	10.4	**	**
6/89	*	*	*	*	*	*
7/89	5.5	4.1	5.1	7.4	4.0	6.8
8/89	7.6	7.8	6.3	7.8	10.2	5.9
9/89	*	*	*	**	**	**

* No Data
** No Seine

(e) = early
(l) = late

Site 1 = Breezy Point
Site 2 = DuBois Point
Site 3 = North Channel Bridge
Site 4 = Hangar B
Site 5 = Barren Island Marina
Site 6 = Plumb Beach

Table X

SALINITY (ppt) FOR EACH GILL NET LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Gill Net Site								
Date	1	2	3	4	5	6	7	8	9
11/85	*	*	*	*	*	*	*	*	*
12/85	28.1	26.2	25.9	25.2	27.0	25.9	25.7	24.2	27.0
3/86	26.3	27.0	27.1	26.2	26.3	25.6	26.2	26.0	26.3
4/86	27.3	26.2	26.3	25.6	25.6	24.0	24.9	25.6	26.5
5/86	34.0	29.5	30.0	28.7	30.2	29.7	29.0	31.2	31.0
6/86	32.3	31.0	30.8	30.3	31.7	28.0	28.8	31.0	27.3
8/86	28.4	26.7	27.1	24.8	27.2	24.8	25.5	26.0	28.0
9/86(e)	*	30.2	30.0	28.2	*	27.6	28.0	29.5	25.5
9/86(1)	31.3	30.7	30.0	28.7	30.7	28.7	28.6	30.0	31.3
10/86	37.8	37.6	36.8	34.0	36.5	34.0	34.7	36.2	36.8

*No Data
**No Samples
(e) = early
(1) = late

Table XI

SALINITY (ppt) FOR EACH OTTER TRAWL SAMPLE LOCATION
IN JAMAICA BAY
NOVEMBER 1985 TO OCTOBER 1989

	Trawl Site														
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11/85	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12/85	28.7	28.0	27.5	26.5	26.6	26.1	26.2	25.8	27.5	25.8	25.0	25.8	25.9	25.8	25.9
3/86	30.0	27.8	27.2	23.4	27.2	27.1	27.0	26.5	26.5	26.0	26.0	25.9	26.1	26.1	24.4
4/86	27.9	26.8	26.3	26.8	26.5	25.7	26.0	25.0	24.3	24.0	24.3	24.0	25.5	25.6	25.6
5/86	34.2	34.2	35.7	33.0	32.8	32.2	32.2	29.8	28.2	29.7	30.0	30.0	30.8	30.8	30.9
6/86	34.8	36.0	34.5	33.0	32.2	32.2	32.2	31.3	28.9	31.0	28.6	28.9	30.0	28.9	29.0
8/86	31.0	31.1	30.7	28.5	27.5	26.4	26.5	25.2	24.6	24.3	24.3	24.2	24.6	24.1	24.2
9/86(e)	*	*	*	*	*	*	*	28.7	28.6	29.5	29.5	28.6	*	*	*
9/86(l)	32.0	32.2	32.0	31.8	31.6	31.4	31.7	30.3	31.0	30.7	30.7	30.4	29.8	30.3	30.2
10/86	37.3	38.0	37.7	37.7	36.5	37.3	37.3	35.8	36.0	35.0	35.0	35.2	34.8	35.6	35.3
6/88	*	28.4	27.1	28.4	*	28.4	*	28.4	33.7	28.4	33.7	33.7	33.7	33.7	33.7
7/88	29.1(s) 28.9(b)	28.7(s) 29.8(b)	28.2(s) 28.2(b)	27.9(s) 28.2(b)	27.3(s) 28.2(b)	25.6(s) 26.5(b)	26.1(s) 27.5(b)	25.3(s) 27.5(b)	24.9(s) 26.1(b)	24.3(s) 25.3(b)	25.6(s) 24.1(b)	26.9(s) 27.1(b)	26.7(s) 27.4(b)	27.1(s) 27.0(b)	27.5(s) 27.9(b)
8/88	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9/88	21.3(s) 21.5(b)	21.6(s) 22.0(b)	22.0(s) 22.0(b)	21.4(s) 21.5(b)	21.0(s) 21.9(b)	21.6(s) 21.8(b)	21.9(s) 22.0(b)	21.7(s) 22.1(b)	21.2(s) 21.2(b)	21.1(s) 21.0(b)	22.4(s) 22.1(b)	22.4(s) 22.8(b)	23.0(s) 23.3(b)	22.5(s) 23.2(b)	21.2(s) 23.1(b)
10/88	26.4(s) 28.1(b)	28.4(s) 27.5(b)	24.9(s) 26.6(b)	28.9(s) 26.6(b)	27.0(s) 27.1(b)	27.4(s) 27.6(b)	27.2(s) 27.2(b)	27.3(s) 27.3(b)	27.5(s) 27.9(b)	27.5(s) 27.8(b)	**	27.6(s) 27.1(b)	27.8(s) 28.0(b)	27.8(s) 27.2(b)	**
11/88	25.9(s) 23.3(b)	**	**	**	**	25.2(s) 25.0(b)	25.0(s) 24.5(b)	**	**	**	**	23.4(s) 23.8(b)	**	24.7(s) 24.8(b)	**
12/88	**	**	**	*	23.0	25.0	25.0	**	**	**	**	**	**	**	**
1/89	**	**	**	*	26.0	**	**	**	**	**	26.0	**	**	**	**
2/89	**	**	*	**	26.0	*	**	**	**	**	**	**	**	**	**
3/89	**	**	**	**	27.0(s) 27.0(b)	**	**	**	**	**	**	**	**	**	**
5/89	23.9(s) 23.6(b)	**	19.6(s) 21.7(b)	19.5(s) 19.6(b)	19.6(s) 22.1(b)	**	**	**	**	**	**	**	**	19.0(s) 20.8(b)	**
6/89	25.7(s) 26.4(b)	24.0(s) 27.3(b)	23.7(s) 26.2(b)	22.7(s) 23.7(b)	**	21.6(s) 21.0(b)	22.1(s) 22.2(b)	20.6(s) 20.9(b)	18.7(s) 19.0(b)	18.2(s) 17.4(b)	**	18.4(s) 19.8(b)	18.9(s) 20.0(b)	19.9(s) 20.1(b)	19.3(s) 19.7(b)
7/89	27.2(s) 27.7(b)	28.0(s) 21.8(b)	24.4(s) 26.2(b)	25.5(s) 26.3(b)	24.7(s) 26.1(b)	**	24.0(s) 25.8(b)	23.8(s) 24.5(b)	22.9(s) 23.9(b)	**	22.4(s) 23.9(b)	23.5(s) 23.6(b)	23.3(s) 24.4(b)	24.7(s) 25.1(b)	24.9(s) 25.7(b)
8/89	27.5(s) 26.8(b)	27.0(s) 27.6(b)	26.5(s) 26.8(b)	26.8(s) 26.6(b)	25.2(s) 25.3(b)	25.4(s) 26.2(b)	26.0(s) 25.7(b)	25.2(s) 23.9(b)	24.5(s) 24.0(b)	23.7(s) 22.7(b)	23.3(s) 23.0(b)	24.0(s) 23.5(b)	24.1(s) 23.4(b)	24.5(s) 25.2(b)	25.1(s) 24.3(b)
9/89	26.5(s) 27.1(b)	26.2(s) 26.5(b)	26.0(s) 26.8(b)	25.2(s) 25.6(b)	25.1(s) 26.5(b)	24.8(s) 25.6(b)	24.6(s) 25.3(b)	24.2(s) 24.9(b)	**	**	23.1(s) 24.5(b)	24.4(s) 24.3(b)	24.1(s) 24.5(b)	24.3(s) 24.3(b)	22.5(s) 25.0(b)
10/89	**	**	**	**	**	*	*	*	**	**	**	**	**	**	**

* No Data
** No Travel
--Single number indicates surface salinity
(s) - surface (e) - early
(b) - bottom (l) - late

Table XII

SALINITY (ppt) FOR EACH SEINE SAMPLE LOCATION IN JAMAICA BAY NOVEMBER 1985 TO OCTOBER 1989

	Seine Site					
Date	1	2	3	4	5	6
11/85	**	**	**	**	**	**
12/85	25.8	27.5	24.6	25.6	25.6	**
3/86	22.6	25.2	24.3	25.0	23.3	18.5
4/86	25.7	26.6	27.2	26.0	25.2	25.4
5/86	35.8	31.8	33.7	29.6	30.1	26.6
6/86	30.5	31.7	29.8	29.0	29.0	31.2
8/86	27.1	25.7	25.0	24.3	25.3	28.4
9/86(e)	28.6	30.2	28.1	27.6	28.3	28.6
9/86(l)	29.4	30.3	30.3	28.2	28.3	27.0
10/86	34.8	33.7	33.3	33.0	34.3	35.6
6/88	*	*	*	23.0	**	*
7/88	**	**	**	**	**	**
8/88	**	**	**	**	**	**
9/88	25.3	23.2	23.4	23.4	22.2	23.1
10/88	27.6	27.6	28.0	25.6	26.6	27.6
11/88	**	**	**	**	**	**
12/88	**	**	**	**	*	**
1/89	**	**	**	**	**	**
2/89	**	**	**	**	**	**
4/89	22.6	23.2	23.0	**	25.3	**
5/89	**	**	**	**	**	**
6/89	25.6	19.6	19.8	20.7	23.1	20.0
7/89	20.7	23.0	22.9	26.2	23.5	18.8
8/89	27.6	24.3	24.2	28.5	26.7	27.0
9/89	25.5	22.0	21.6	**	**	**
10/89	**	**	**	**	**	**

*No Data
**No Seine
(e) = early
(l) = late

Table XIII
pH FOR EACH GILL NET LOCATION IN JAMAICA BAY
NOVEMBER 1985 TO OCTOBER 1989

	Gill Net Site								
	1	2	3	4	5	6	7	8	9
Date									
11/85	*	*	*	*	*	*	*	*	*
12/85	8.1	8.0	8.0	7.2	8.0	7.6	7.8	8.0	7.9
3/86	9.0	9.1	9.1	9.0	9.1	9.0	9.1	9.1	9.0
4/86	*	*	*	*	*	*	*	*	*
5/86	7.9	8.5	8.4	8.2	8.0	8.5	8.4	8.0	8.1
6/86	8.1	8.4	8.3	8.2	8.3	8.4	8.3	8.3	8.3
8/86	7.7	7.6	7.7	7.5	7.6	7.5	7.5	7.6	7.6
9/86(e)	*	7.3	7.3	7.2	*	7.0	7.2	7.4	7.2
9/86(l)	6.9	6.9	6.8	7.2	7.0	7.3	6.9	6.8	6.9
10/86	7.8	7.8	7.8	7.6	7.9	7.6	7.8	7.7	7.8

*No Data
**No Sample
(e) - early
(l) - late

Table XIV

pH FOR EACH OTTER TRAWL SAMPLE
LOCATION IN JAMAICA BAY
NOVEMBER 1985 TO OCTOBER 1989

Date	Trawl Site 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
11/85	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12/85	8.7	8.8	8.8	9.0	9.0	9.0	8.9	9.0	8.9	8.9	8.9	8.9	8.9	8.9	8.9
3/86	8.8	8.8	8.9	9.1	9.0	9.0	9.2	9.1	9.0	9.1	9.0	9.2	9.1	9.2	9.1
4/86	8.7	8.7	8.7	8.7	8.7	8.8	8.8	8.8	8.8	8.9	8.8	8.8	8.7	8.7	8.7
5/86	7.7	7.6	7.7	7.9	8.1	8.0	8.1	8.1	8.2	8.3	8.0	8.0	7.9	7.9	8.1
6/86	7.9	8.1	8.1	8.1	8.3	8.1	8.2	8.1	8.2	8.1	8.0	8.1	8.1	8.2	8.2
8/86	7.8	7.8	7.8	7.6	8.5	7.7	7.5	7.6	7.4	7.3	7.4	7.4	7.4	7.9	7.6
9/86(e)	*	*	*	*	*	*	*	7.0	*	*	*	*	*	*	*
9/86(l)	7.0	7.0	6.8	6.5	7.3	6.9	6.5	6.6	6.5	6.7	6.6	6.7	6.8	6.8	6.7
10/86	7.5	7.7	7.0	7.4	7.5	7.2	7.3	5.9	7.8	7.2	7.5	7.4	7.6	7.0	7.6
6/88	7.8	8.1	8.4	8.4	8.4	8.4	8.4	8.4	8.6	8.4	7.8	8.2	8.4	8.2	8.0
7/88	7.2(s) 7.2(b)	7.1(s) 7.2(b)	7.2(s) 7.1(b)	7.0(s) 7.0(b)	7.5(s) 7.2(b)	7.3(s) 7.1(b)	7.3(s) 7.1(b)	7.4(s) 7.2(b)	7.3(s) 7.1(b)	7.4(s) 7.1(b)	7.5(s) 7.1(b)	7.3(s) 7.1(b)	7.3(s) 7.1(b)	7.2(s) 7.1(b)	7.2(s) 7.2(b)
8/88	7.5(s) 7.3(b)	7.7(s) 7.8(b)	7.3(s) 7.3(b)	7.3(s) 7.2(b)	*	*	*	*	*	*	*	*	7.4(s)	*	*
9/88	9.6(s) 8.5(b)	7.2(s) 7.3(b)	7.2(s) 7.2(b)	7.2(s) 7.2(b)	7.4(s) 7.2(b)	7.3(s) 7.1(b)	7.2(s) 7.1(b)	7.1(s) 7.0(b)	6.1(s) 6.3(b)	6.9(s) 6.8(b)	6.3(s) 6.7(b)	6.8(s) 6.8(b)	7.2(s) 6.9(b)	7.0(s) 7.0(b)	7.2(s) 7.0(b)
10/88	7.8(s) 7.3(b)	7.8(s) 7.3(b)	7.8(s) 7.6(b)	7.8(s) 7.3(b)	7.3(s) 7.3(b)	7.3(s) 7.2(b)	7.1(s) 7.1(b)	7.7(s) 7.3(b)	7.7(s) 7.3(b)	7.2(s) 7.1(b)	**	7.1(s) 7.1(b)	7.1(s) 7.1(b)	7.1(s) 7.1(b)	**
11/88	*	**	**	**	**	*	*	**	**	**	**	*	**	*	**
12/88	**	**	**	*	7.6	7.9	7.9	**	**	**	**	**	**	*	**
1/89	**	**	**	*	7.8	**	**	**	**	**	7.9	**	**	**	**
2/89	**	**	**	**	*	*	**	**	**	**	**	**	**	**	**
3/89	**	**	**	**	8.1(s) 7.6(b)	**	**	**	**	**	**	**	**	**	**
5/89	7.5(s) 7.7(b)	**	7.4(s) 7.4(b)	7.2(s) 7.5(b)	7.9(s) 7.8(b)	**	**	**	**	**	**	**	**	8.0(s) 7.8(b)	**
6/89	8.1(s)	6.6(s) 6.5(b)	8.0(s) 9.0(b)	8.3(s) 9.3(b)	**	7.5(s) 7.4(b)	9.0(s) 8.1(b)	7.8(s) 8.4(b)	9.0(s) 7.8(b)	7.6(s) 7.4(b)	**	8.1(s) 7.3(b)	8.0(s) 7.3(b)	7.5(s) 7.3(b)	7.2(s) 8.1(b)
7/89	7.3(s) 7.6(b)	7.7(s) 7.7(b)	7.2(s) 7.3(b)	7.4(s) 7.4(b)	7.3(s) 7.3(b)	**	7.3(s) 7.3(b)	7.3(s) 7.2(b)	7.2(s) 7.1(b)	**	7.6(s) 7.1(b)	7.3(s) 7.1(b)	7.3(s) 7.2(b)	7.4(s) 7.3(b)	7.4(s) 7.3(b)
8/89	7.3(s) 7.5(b)	7.7(s) 7.5(b)	7.4(s) 7.4(b)	7.7(s) 7.5(b)	7.8(s) 7.6(b)	7.8(s) 7.2(b)	8.0(s) 7.6(b)	7.9(s) 7.5(b)	7.6(s) 7.3(b)	7.8(s) 7.3(b)	7.9(s) 7.5(b)	7.6(s) 7.3(b)	7.8(s) 7.6(b)	8.1(s) 7.6(b)	7.9(s) 7.6(b)
9/89	7.1(s) 7.4(b)	7.5(s) 7.5(b)	7.5(s) 7.5(b)	7.5(s) 7.6(b)	7.7(s) 7.6(b)	7.5(s) 7.7(b)	7.6(s) 7.6(b)	7.5(s) 7.5(b)	7.6(s) 7.3(b)	**	**	7.6(s) 7.5(b)	7.6(s) 7.5(b)	7.6(s) 7.6(b)	7.9(s) 4.1(b)
10/89	**	**	**	**	**	*	*	*	**	**	**	**	**	**	**

*No Data
**No Trawl
--Single number indicates surface pH only
(s) = surface (e) = early
(b) = bottom (l) = late

Table XV

pH FOR EACH SEINE SAMPLE
LOCATION IN JAMAICA BAY
NOVEMBER 1985 TO OCTOBER 1989

	Seine Site					
Date	1	2	3	4	5	6
11/85	*	*	*	*	*	*
12/85	8.9	8.7	8.8	8.9	8.9	**
3/86	9.0	8.9	9.1	9.1	9.2	8.9
4/86	*	8.6	8.2	*	*	*
5/86	7.8	7.9	8.0	7.8	8.1	8.3
6/86	8.2	8.0	8.3	8.2	8.2	8.3
8/86	7.6	7.7	7.5	7.4	7.7	7.9
9/86(e)	*	7.5	*	*	*	*
9/86(l)	6.7	7.0	6.7	6.7	7.3	8.0
10/86	7.8	7.2	7.6	7.3	7.2	7.2
6/88	8.2	8.5	8.8	8.6	**	*
7/88	**	**	**	**	**	**
8/88	*	*	*	*	*	*
9/88	8.0	7.1	7.2	7.3	5.9	7.5
10/88	7.7	7.0	7.0	7.6	7.3	8.6
4/89	6.4	7.1	7.5	7.6	**	**
6/89	7.5	6.8	7.0	6.9	6.8	7.0
7/89	7.2	7.4	6.3	7.4	7.4	7.8
8/89	6.9	6.8	7.0	7.7	7.3	7.1
9/89	*	*	*	**	**	**

* No Data
** No Seine

(e) = early
(l) = late

Site 1 = Breezy Point
Site 2 = DuBois Point
Site 3 = North Channel Bridge
Site 4 = Hangar B
Site 5 = Barren Island Marina
Site 6 = Plumb Beach

Table XVI

Chlorophyll a (mg/m3) For Trawl Sites
in Jamaica Bay
June 1988 to October 1989

Site	6/88	7/88	8/88	9/88	10/88	11/88	12/88	1/89
TS-1	3.86	1.044	.70	.07	28	.096	*	*
TS-2	*	1.798	1.044	.092	.112	*	*	*
TS-3	5.075	2.03	1.16	.08	.40	*	*	*
TS-4	5.684	2.90	1.914	.064	.32	*	.36	.44
TS-5	7.105	4.466	2.088	.38	.42	*	.28	.36
TS-6	6.902	6.699	1.566	.22	.48	.30	.32	*
TS-7	4.872	5.481	2.03	.36	.32	.172	.32	*
TS-8	5.887	4.669	2.32	.38	.36	*	*	*
TS-9	6.902	5.481	2.494	.40	.60	*	*	*
TS-10	5.887	9.947	1.392	.87	.40	*	*	*
TS-11	.08	7.105	1.74	.87	*	*	*	.40
TS-12	.812	4.263	1.102	.52	.42	.72	*	*
TS-13	1.45	3.451	.986	.132	*	*	*	*
TS-14	1.74	3.045	1.566	.092	.60	.232	*	*
TS-15	2.03	5.684	2.03	*	.112	*	*	*

* No Data

Table XVII
Chlorophyll a (mg/m3) For Trawl Sites in Jamaica Bay
June 1988 to October 1989

Site	2/89	3/89	5/89	6/89	7/89	8/89	9/89	10/89
TS-1	*	*	.32	.36	.32	.36	.32	*
TS-2	*	*	*	.44	.87	.16	.32	*
TS-3	*	*	*	.36	.28	.24	.32	*
TS-4	*	*	*	.44	.36	.52	.36	*
TS-5	.36	.28	*	.24	.64	.64	*	.32
TS-6	.20	*	*	.24	*	.68	.36	.28
TS-7	*	*	*	.40	.40	.60	.36	.32
TS-8	*	*	*	.52	.36	.56	.36	.36
TS-9	*	*	*	.44	.32	.48	.44	*
TS-10	*	*	*	.28	*	.72	.32	*
TS-11	*	*	*	.40	*	.80	.40	*
TS-12	*	*	*	.40	.44	.56	.36	*
TS-13	*	*	*	.40	.36	.48	.36	*
TS-14	*	*	*	.40	.36	.50	.32	*
TS-15	*	*	*	.40	.48	.52	.36	*

* No Data

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Table XVIII

Total and Fecal Coliform
For Each Otter Trawl
Sample Location in Jamaica Bay
Fisheries Survey
June 1988 to October 1989

Date	1		2		3		4		5		6		7		8		9		10		11		12		
	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	
6/88	*	*	*	*	44	6	0	0	144	11	261	0	255	78	217	50	228	33	250	95	211	0	156	122	
7/88	366	67	988	122	799	311	710	189	1543	100	2831	377	1976	278	CON	2331	TNC	TNC	TNC	TNC	1077	677	1454	211	
8/88	544	211	122	44	333	33	500	22	389	56	CON	890	CON	5400	9200	4700	6100	4300	7300	1066	CON	790	66	44	
9/88	175	0	250	100	588	200	113	0	25	0	25	50	50	50	138	0	1367	350	100	50	13	0	38	0	
10/88	*	*	*	*	*	*	*	*	122	13	1600	400	1300	500	725	250	TNC	2300	167	50	*	*	56	0	
11/88	425	132	*	*	*	*	*	*	*	*	800	121	330	132	*	*	*	*	*	*	*	*	167	78	
12/88	*	*	*	*	*	*	344	200	322	155	500	278	278	178	*	*	*	*	*	*	*	*	*	*	
1/89	*	*	*	*	*	*	333	89	78	33	*	*	*	*	*	*	*	*	*	*	*		67	44	*
2/89	*	*	*	*	*	*	*	*	56	11	22	0	*	*	*	*	*	*	*	*	*	*	*	*	
3/89	*	*	*	*	*	*	*	*	99	33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
5/89	*	*	*	*	4166	1155	1188	99	935	33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
6/89	99	0	330	22	1034	385	77	0	*	*	275	88	242	44	253	11	*	*	*	*	*	*	*	*	
7/89	812	203	4350	8091	4466	6670	5467	3016	6061	580	*	*	928	203	667	0	1160	87	*	*	638	0	1189	0	
8/89	*	*	603	0	4158	69	1996	69	804	276	402	0	2479	276	4066	138	7772	138	603	69	804	0	603	69	
9/89	1218	0	1073	0	1350	0	464	0	348	0	1131	203	2103	71	3000	0	*	*	*	*	391	418	232	0	

TNC = Too Numerous to Count
CON = Confluent
* = No Data

Table XIX

Total and Fecal Coliform For Each Otter Trawl Sample Location in Jamaica Bay Fisheries Survey June 1988 to October 1989

Date	13		14		15	
	Total	Fecal	Total	Fecal	Total	Fecal
6/88	284	0	189	56	67	28
7/88	1221	78	966	266	733	167
8/88	167	44	1077	699	855	344
9/88	150	150	88	100	125	150
10/88	200	0	400	150	*	*
11/88	*	*	111	22	*	*
12/88	*	*	*	*	*	*
1/89	*	*	*	*	*	*
2/89	*	*	*	*	*	*
3/89	*	*	*	*	*	*
5/89	*	*	1166	55	*	*
6/89	473	22	539	209	3102	1001
7/89	4118	319	5975	3393	3364	145
8/89	871	0	1742	138	737	0
9/89	609	0	348	0	*	*

TNC = Too Numerous to Count
CON = Confluent
* = No Data

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PAGE

Table XX

Conductivity (mmho/cm) For Each Otter Trawl
Sample Location in
Jamaica Bay
June 1988 to September 1989

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
6/88	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7/88	39.3 (s)	39.7 (s)	40.7 (s)	41.3 (s)	42.0 (s)	39.1 (s)	39.2 (s)	38.6 (s)	38.3 (s)	37.3 (s)	39.3 (s)	41.1 (s)	41.1 (s)	40.9 (s)	41.1 (s)
	38.1 (b)	37.6 (b)	40.2 (b)	41.1 (b)	40.4 (b)	*	40.9 (b)	40.5 (b)	39.7 (b)	38.4 (b)	36.9 (b)	40.6 (b)	40.6 (b)	40.6 (b)	40.9 (b)
8/88	54.6 (s)	56.1 (s)	56.3 (s)	54.3 (s)	*	*	*	*	*	*	*	*	*	*	*
	56.4 (b)	56.4 (b)	48.6 (b)	54.5 (b)	*	*	*	*	*	*	*	*	*	*	8
9/88	57.0 (s)	55.2 (s)	54.5 (s)	53.5 (s)	53.0 (s)	52.4 (s)	52.9 (s)	52.1 (s)	49.5 (s)	51.4 (s)	49.0 (s)	52.2 (s)	50.5 (s)	49.1 (s)	50.6 (s)
	56.8 (b)	45.3 (b)	50.4 (b)	53.5 (b)	55.3 (b)	53.6 (b)	53.7 (b)	52.4 (b)	49.3 (b)	50.2 (b)	48.7 (b)	51.4 (b)	50.5 (b)	50.4 (b)	50.4 (b)
10/88	33.4 (s)	32.3 (s)	32.0 (s)	55.8 (s)	55.0 (s)	53.7 (s)	52.9 (s)	52.3 (s)	50.7 (s)	58.3 (s)	*	51.9 (s)	54.0 (s)	*	*
	33.5 (b)	32.5 (b)	33.3 (b)	58.0 (b)	55.3 (b)	53.9 (b)	53.7 (b)	52.8 (b)	51.7 (b)	58.3 (b)	*	52.4 (b)	51.3 (b)	*	*
11/88	24.9 (s)	*	*	*	*	26.2 (s)	25.9 (s)	*	*	*	*	25.4 (s)	*	26.3 (s)	*
	26.4 (b)	*	*	*	*	25.9 (b)	25.7 (b)	*	*	*	*	25.5 (b)	*	26.6 (b)	*
5/89	38.3 (s)	*	35.8 (s)	35.6 (s)	35.6 (s)	*	*	*	*	*	*	*	*	34.7 (s)	*
	36.5 (b)	*	36.7 (b)	36.2 (b)	36.1 (b)	*	*	*	*	*	*	*	*	35.2 (b)	*
6/89	43.4 (s)	43.1 (s)	40.0 (s)	37.9 (s)	*	36.7 (s)	36.6 (s)	35.3 (s)	34.2 (s)	34.2 (s)	*	34.0 (s)	33.9 (s)	35.9 (s)	35.0 (s)
	44.6 (b)	45.8 (b)	43.1 (b)	39.2 (b)	*	37.5 (b)	36.5 (b)	36.3 (b)	35.1 (b)	35.2 (b)	*	36.3 (b)	36.1 (b)	36.4 (b)	36.0 (b)
7/89	44.9 (s)	46.4 (s)	43.3 (s)	42.9 (s)	42.4 (s)	*	40.5 (s)	39.8 (s)	38.6 (s)	*	37.8 (s)	38.6 (s)	38.7 (s)	40.3 (s)	41.6 (s)
	44.8 (b)	46.4 (b)	37.9 (b)	41.6 (b)	42.5 (b)	*	42.0 (b)	40.4 (b)	37.8 (b)	*	39.8 (b)	36.0 (b)	40.5 (b)	40.6 (b)	41.8 (b)
8/89	44.3 (s)	44.0 (s)	43.5 (s)	42.9 (s)	41.8 (s)	41.8 (s)	42.0 (s)	41.6 (s)	40.4 (s)	39.4 (s)	38.5 (s)	39.5 (s)	39.8 (s)	40.4 (s)	41.2 (s)
	44.2 (b)	44.3 (b)	44.3 (b)	42.8 (b)	43.3 (b)	40.9 (b)	38.6 (b)	40.8 (b)	41.1 (b)	40.4 (b)	39.3 (b)	39.6 (b)	40.4 (b)	40.9 (b)	42.2 (b)
9/89	43.4 (s)	43.6 (s)	44.4 (s)	42.6 (s)	42.6 (s)	41.5 (s)	41.6 (s)	41.5 (s)	*	*	39.1 (s)	40.9 (s)	41.6 (s)	41.3 (s)	41.6 (s)
	43.3 (b)	45.0 (b)	41.9 (b)	43.3 (b)	44.0 (b)	44.0 (b)	42.1 (b)	40.7 (b)	*	*	41.8 (b)	41.2 (b)	41.8 (b)	38.4 (b)	42.4 (b)

* No Data
(s) Surface
(b) Bottom

Table XXI

Comparison of Mean Lengths of Fish Captured by Otter Trawl in Jamaica Bay with Adult Mean Lengths of the Same Species
June 1988 to October 1989

Species	Jamaica Bay Mean Length	Adult Mean Length
Spotted Hake	15.63 cm	40 cm
Tautog	2.09 cm	91 cm
Winter Flounder	18.34 cm	64 cm
Cunner	16.07 cm	38 cm
Scup (Porgy)	10.97 cm	38 cm
Lined Seahorse	10.41cm	15 cm
Black Sea Bass	8.89 cm	30 cm
Red Hake	11.04 cm	52 cm
Northern Pipefish	37.07 cm	30 cm
Northern Searobin	12.66 cm	38 cm
Spotfin Butterflyfish	4.05 cm	20 cm
Bigeye	11. cm	30 cm
Windowpane	16.43 cm	45 cm
Grubby	11.1 cm	18 cm
Smallmouth Flounder	7.56 cm	13 cm
Rock Gunnel	14.73 cm	30 cm
Clearnosed Skate	55.05 cm	84 cm
Butterfish	3.15 cm	30 cm
Red Porgy	14.5 cm	91 cm
Atlantic Silversides	6.36 cm	15 cm
Summer Flounder	30.17 cm	94 cm
Planehead Filefish	13.18 cm	25 cm
Nothern Stargazer	12.2 cm	56 cm
Orange Filefish	16.9 cm	60 cm
Striped Searobin	12.24 cm	45 cm
Atlantic Herring	26.3 cm	45 cm
Inshore Lizardfish	15.07	45 cm
Spiny Dogfish	41.27	120 cm
Northern Puffer	4.13 cm	36 cm
American Eel	20.22 cm	90 cm
Northern Kingfish	11.68 cm	46 cm
Four-spot Flounder	9.3 cm	41 cm
Smooth Dogfish	7.0 cm	150 cm
Bluespotted Coronetfish	29.65 cm	180 cm
Weakfish	9.93 cm	91 cm
Bluebacked Herring	21.27 cm	40 cm
White Perch	12.1 cm	48 cm
Oyster Toadfish	15.71 cm	38 cm
Tomcod	10.7 cm	38 cm
Alewife	9.7 cm	40 cm
Striped Bass	38.2 cm	180 cm
Naked Goby	5.5 cm	6cm
Hogchoaker	11.7 cm	20 cm
Fourspine Stickleback	4.0 cm	6.3 cm
Bay Anchovy	8.3 cm	10 cm
Blackmouth Bass	4.5 cm	25 cm
Spot	15.9 cm	36 cm
Grey Snapper	6.2 cm	60 cm

Table XXII

Comparison of Mean Lengths of Fish Captured by otter Trawl and Gill Net in Jamaica Bay with Adult Mean Lengths of the Same Species
December 1985 to October 1986

Species	Jamaica Bay Mean Length	Adult Mean Length
Smooth Dogfish	35.2 cm	120 cm
Little Skate	40.1 cm	53 cm
American Eel	37.9 cm	90 cm
Atlantic Menhaden	34.5 cm	35 cm
Bluebacked Herring	21.6 cm	30 cm
Alewife	13.0 cm	30 cm
Bay Anchovy	6.9 cm	10 cm
Oyster Toadfish	14.72 cm	38 cm
Atlantic Cod	4.3 cm	140 cm
Silver Hake	6.8 cm	76 cm
Red Hake	7.5 cm	52 cm
Spotted Hake	9.25 cm	40 cm
White Hake	7.5 cm	135 cm
Mummichog	4.55 cm	12.5 cm
Atlantic Silversides	9.7 cm	15 cm
Fourspine Stickleback	4.25 cm	6.3 cm
Bluespotted Coronetfish	40.9 cm	180 cm
Lined Seahorse	11.97 cm	15 cm
Northern Pipefish	17.96 cm	30 cm
Striped Bass	19.45 cm	180 cm
Black Sea Bass	10.57 cm	60 cm
Yellow Jack	3.7 cm	100 cm
Lookdown	6.2 cm	30 cm
Scup	9.96 cm	46 cm
Weakfish	6.55 cm	91 cm
Spotfin Butterflyfish	4.3 cm	20 cm
Tautog	17.13 cm	91 cm
Cunner	6.48 cm	38 cm
American Sadlance	13.9 cm	20 cm
Rock Gunnel	12.23 cm	30 cm
Butterfish	5.95 cm	30 cm
Striped Searobin	9.7 cm	45 cm
Grubby	9.5 cm	18 cm
Smallmouth Flounder	10.35 cm	13 cm
Summer Flounder	27.33 cm	94 cm
Four-spot Flounder	14.85 cm	41 cm
Windowpane	24.09	45 cm
Winter Flounder	19.76 cm	64 cm
Planehead Filefish	4.15 cm	36 cm
Northern Puffer	4.15 cm	36 cm

Figure 1.

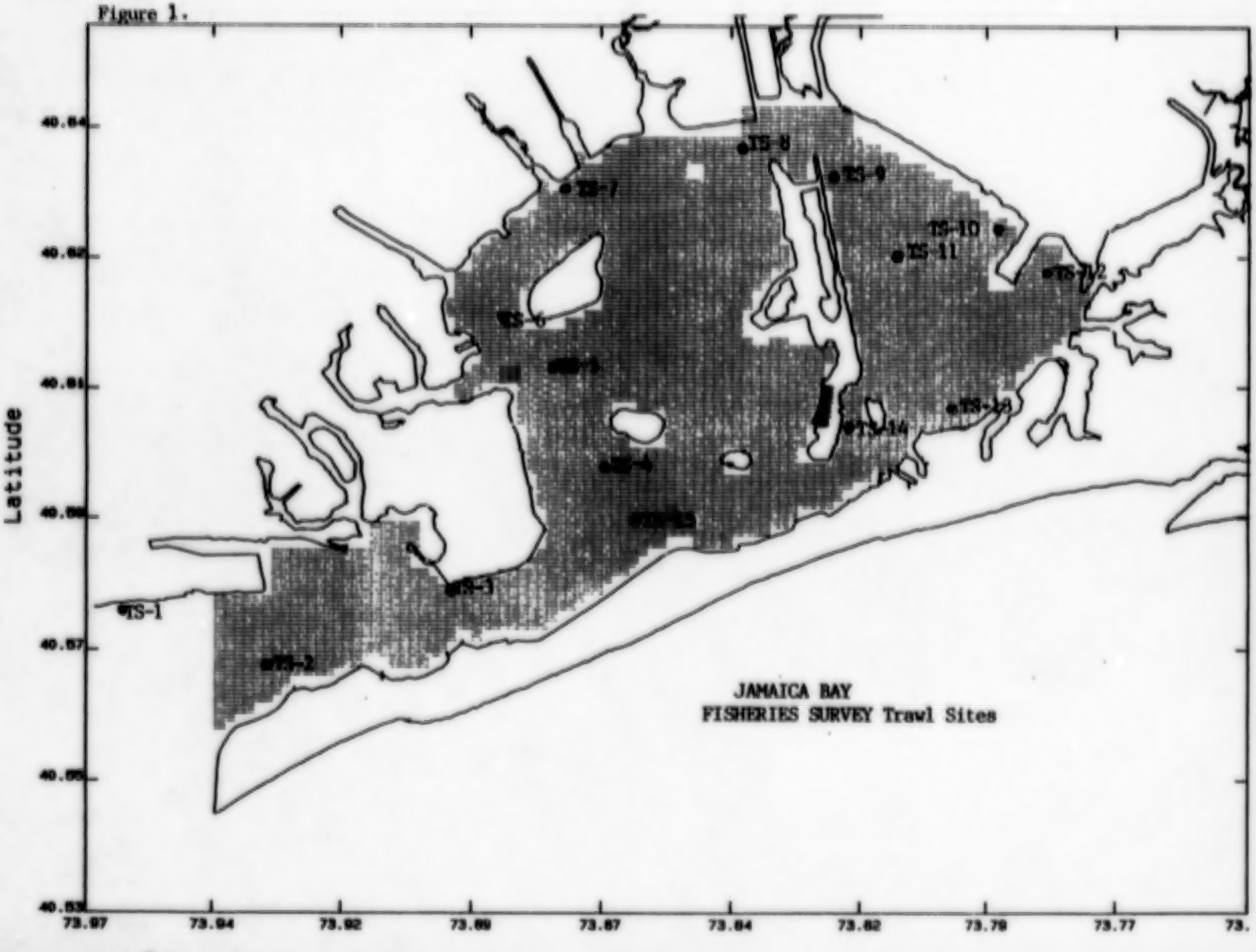
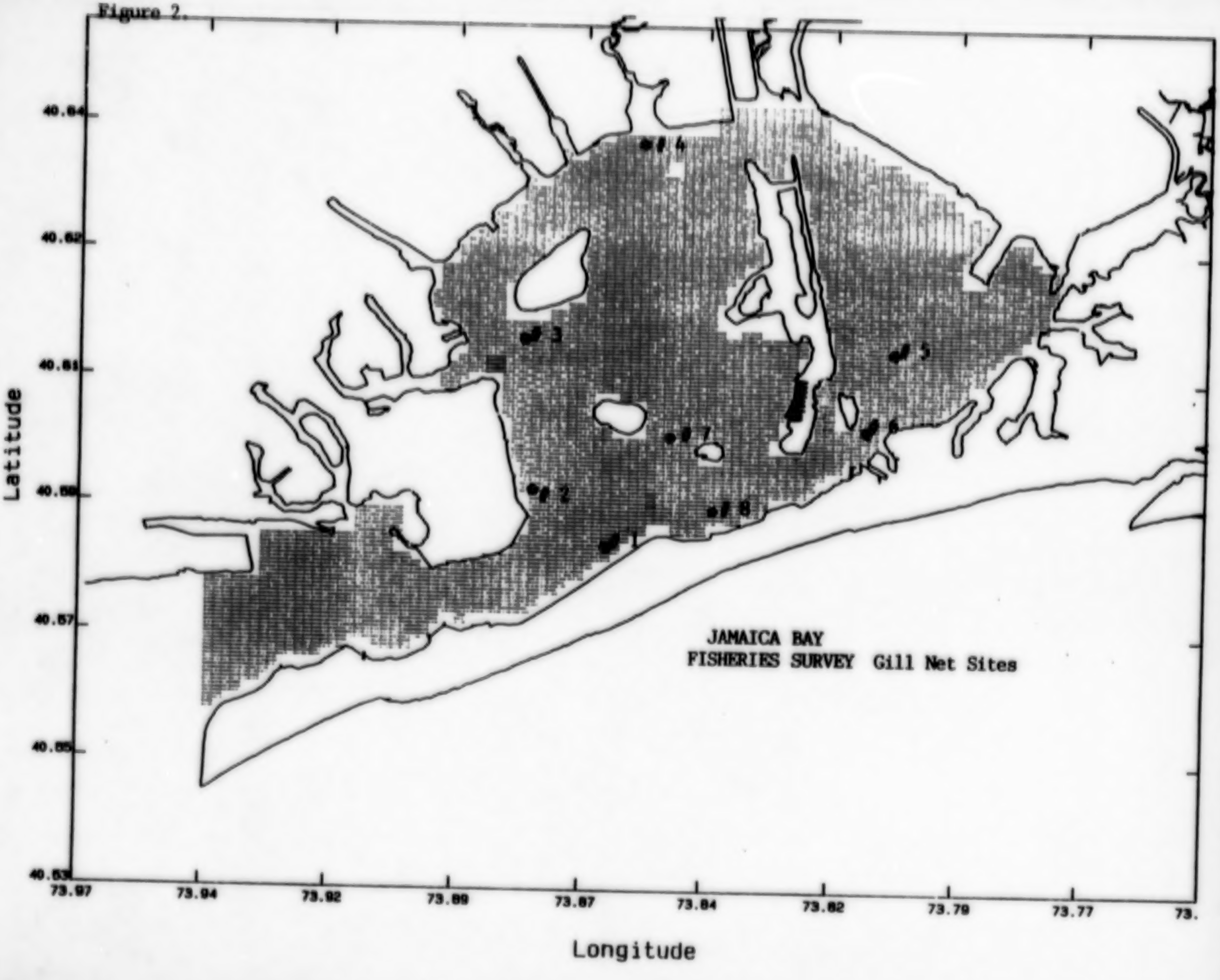
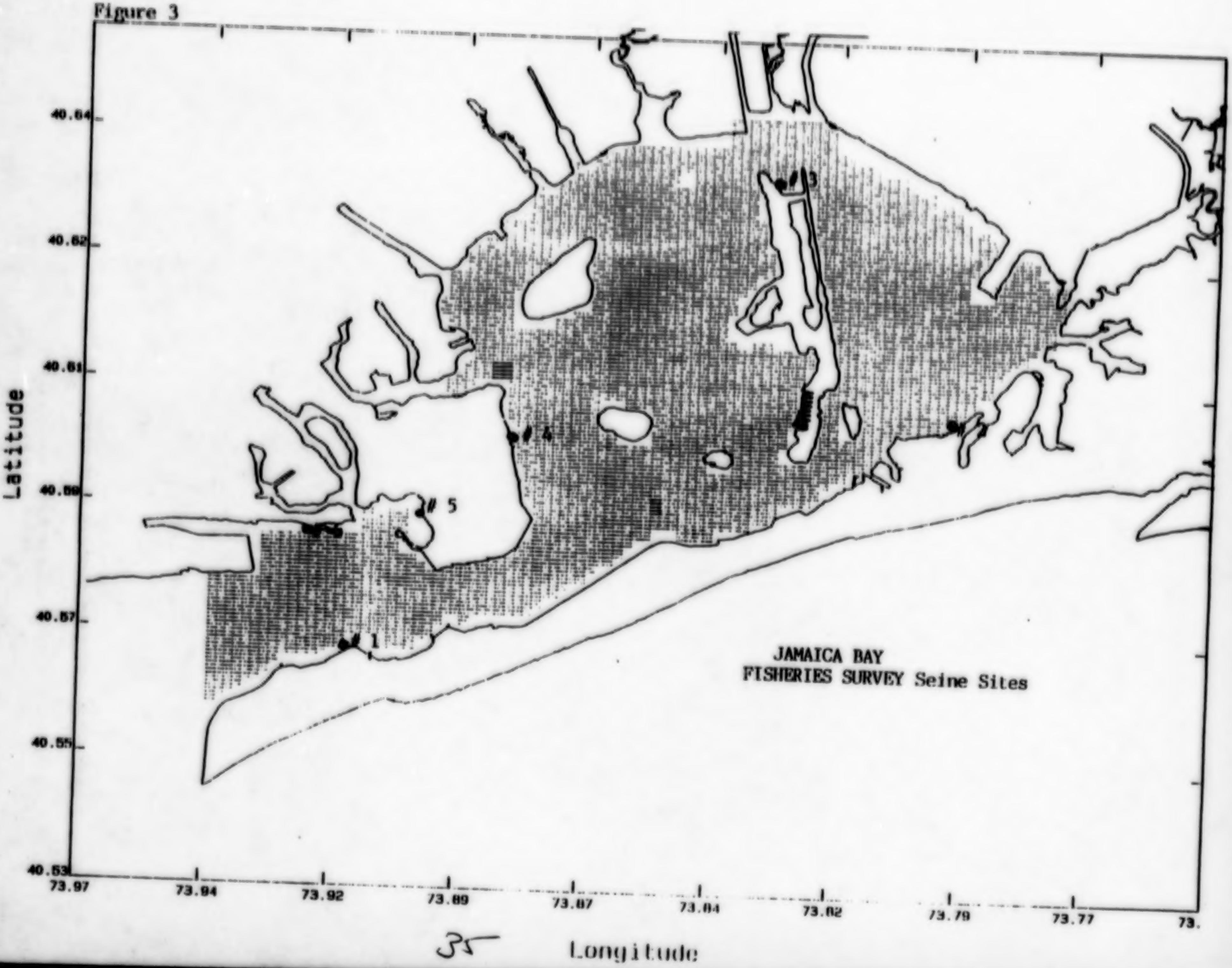

JAMAICA BAY
FISHERIES SURVEY Trawl Sites
TS-1
TS-2
TS-3
TS-4
TS-5
TS-6
TS-7
TS-8
TS-9
TS-10
TS-11
TS-12
TS-13
TS-14
TS-15
Latitude
40.64
40.62
40.61
40.59
40.57
40.55
40.53
73.97
73.94
73.92
73.89
73.87
73.84
73.82
73.79
73.77
73.
Longitude

Figure 2.



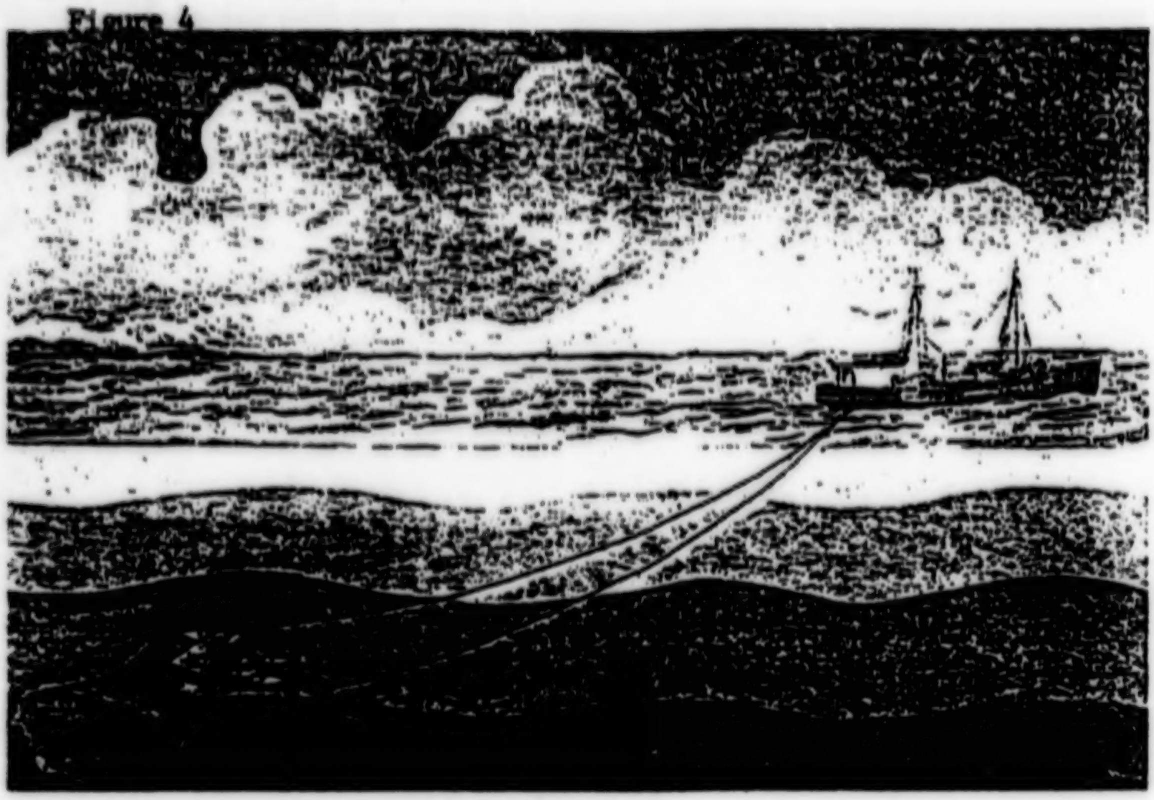
JAMAICA BAY
FISHERIES SURVEY Gill Net Sites

Figure 3



JAMAICA BAY
FISHERIES SURVEY Seine Sites

Figure 4



Otter Trawl Operation [From Royce, 1984]

Figure 5

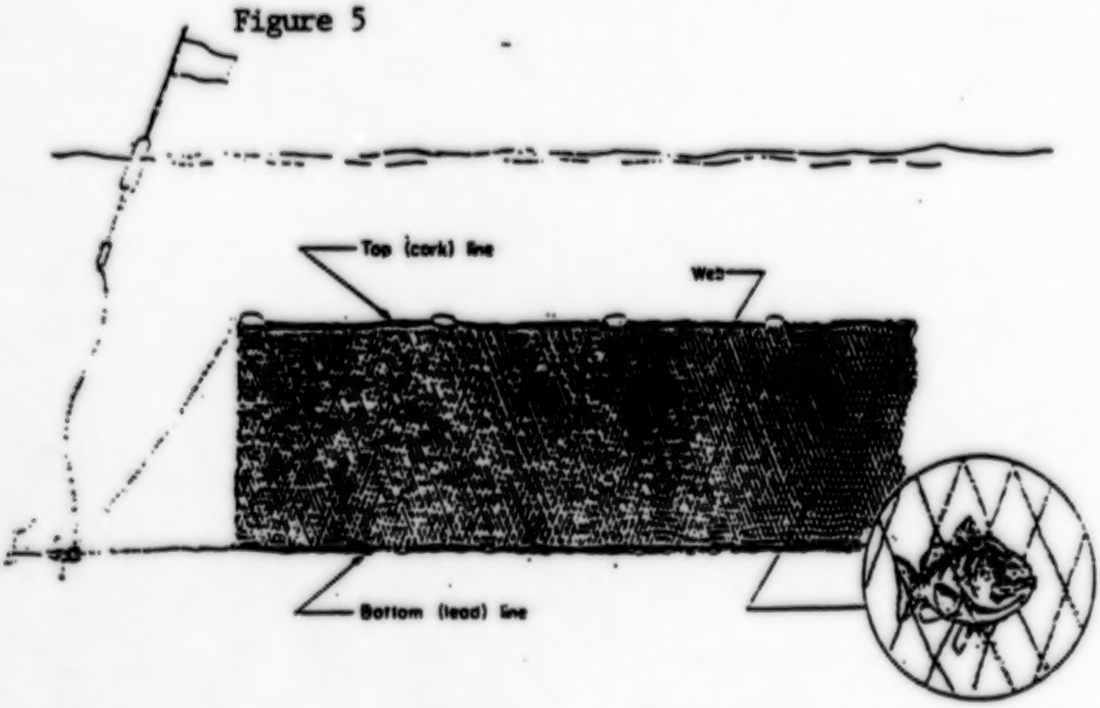


Diagram of a gill net when set. At right, a captured ("gilled") fish. Source: RICKER, W.E., ed. 1971. Methods for Assessment of Fish Production in Fresh Waters. IBP Handbook No. 3. Blackwell Scientific Publ., Oxford, England.

Figure 6

Seine Operation [From Ricker, 1971]

Figure 7

Seasonal Average Temperature

for trawl sites

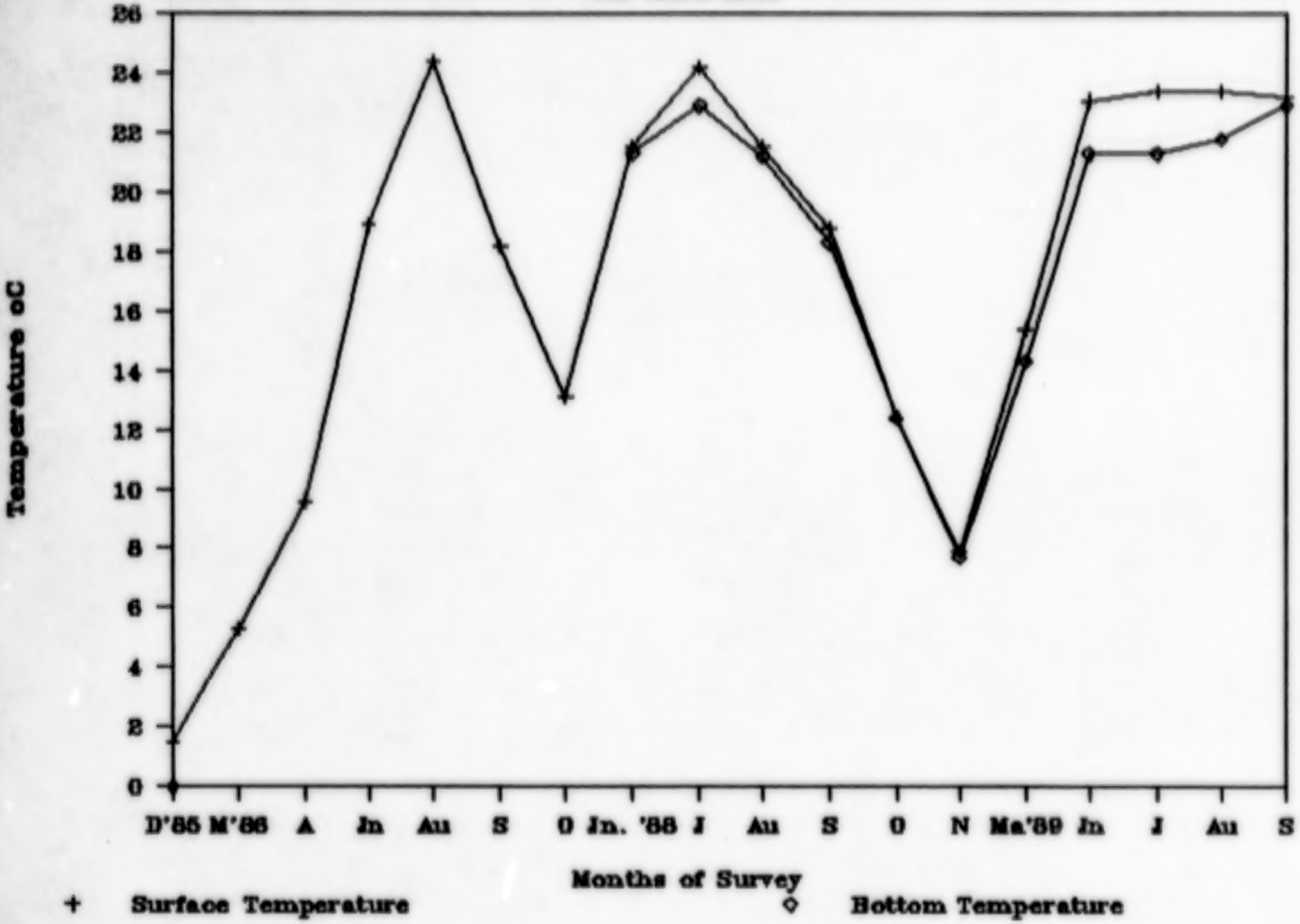


Figure 8

Seasonal Average Temperatures

for Gill Net Sites

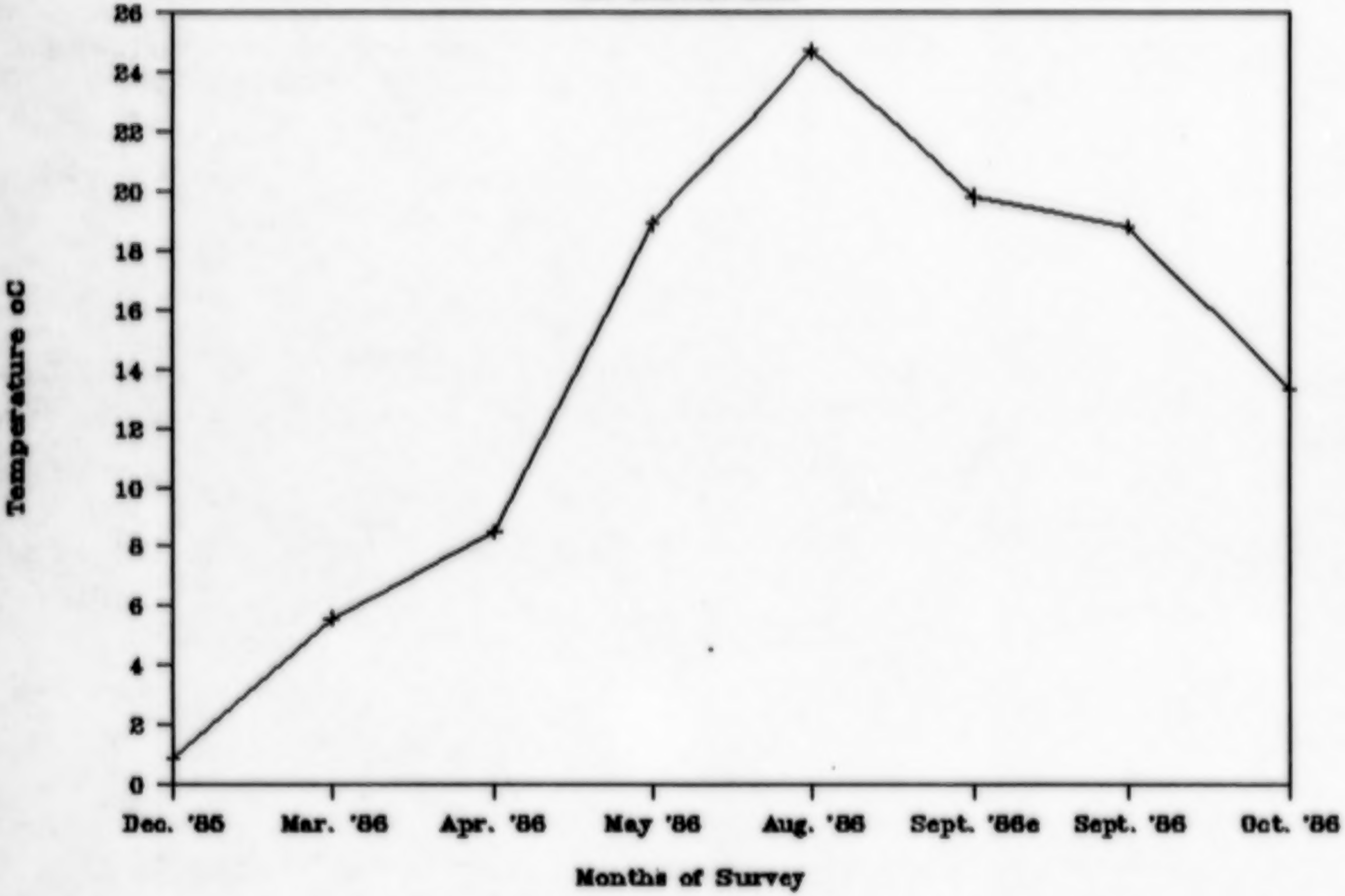


Figure 9

Seasonal Average Temperature

for Seine Sites

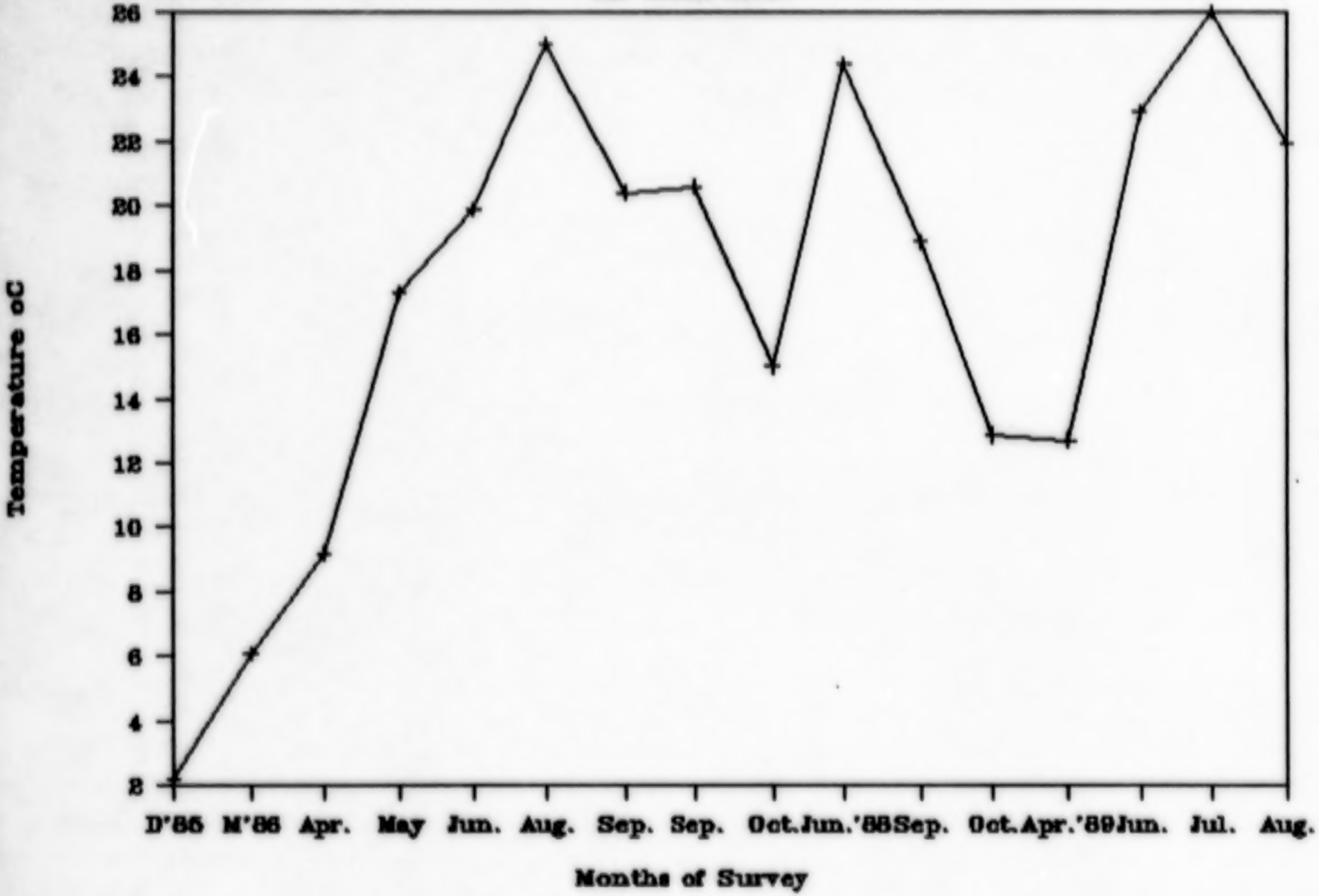


Figure 10

Catch Percentage for 6 Species

of Finfish by Gill Net in Jamaica Bay

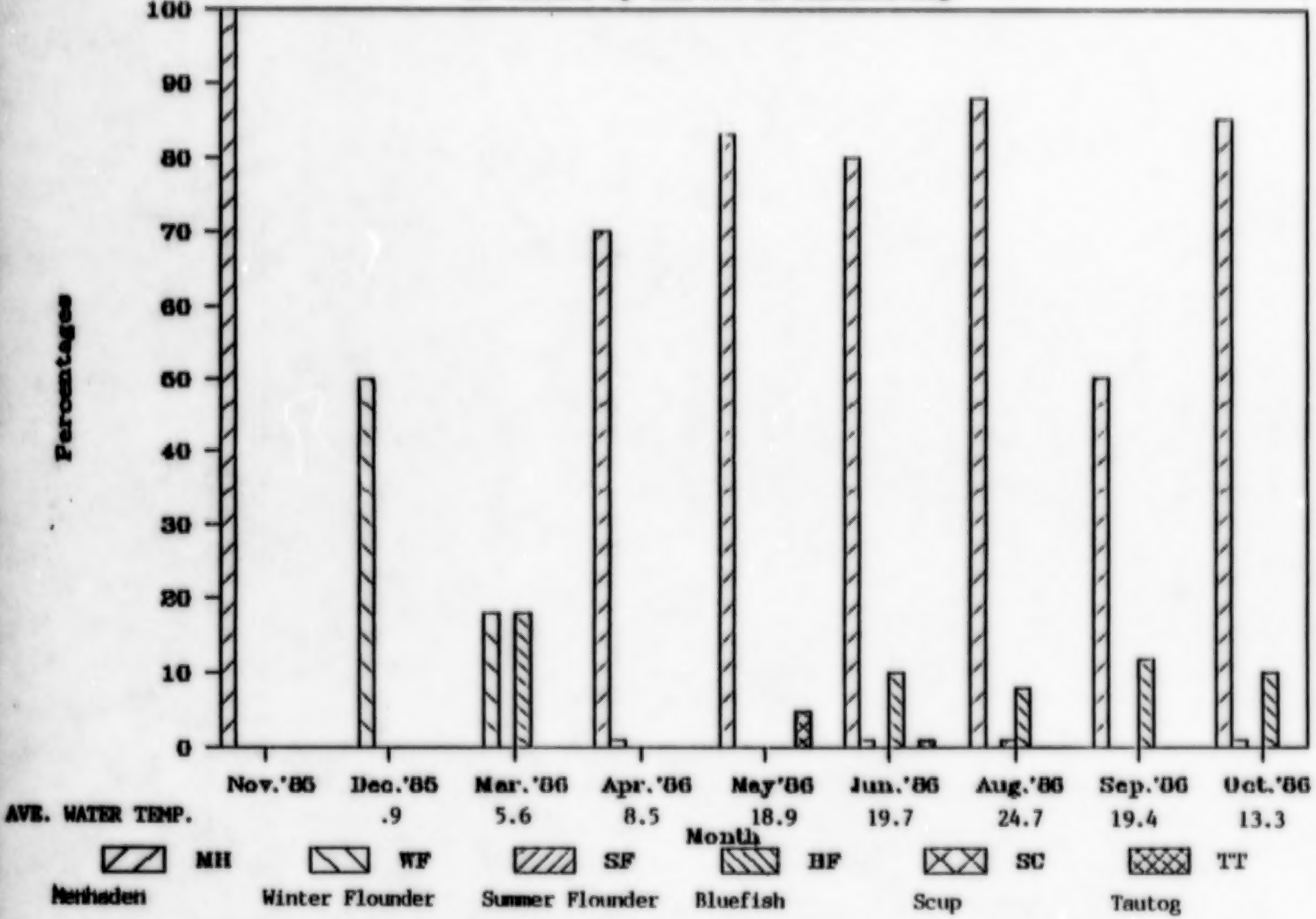


Figure 11

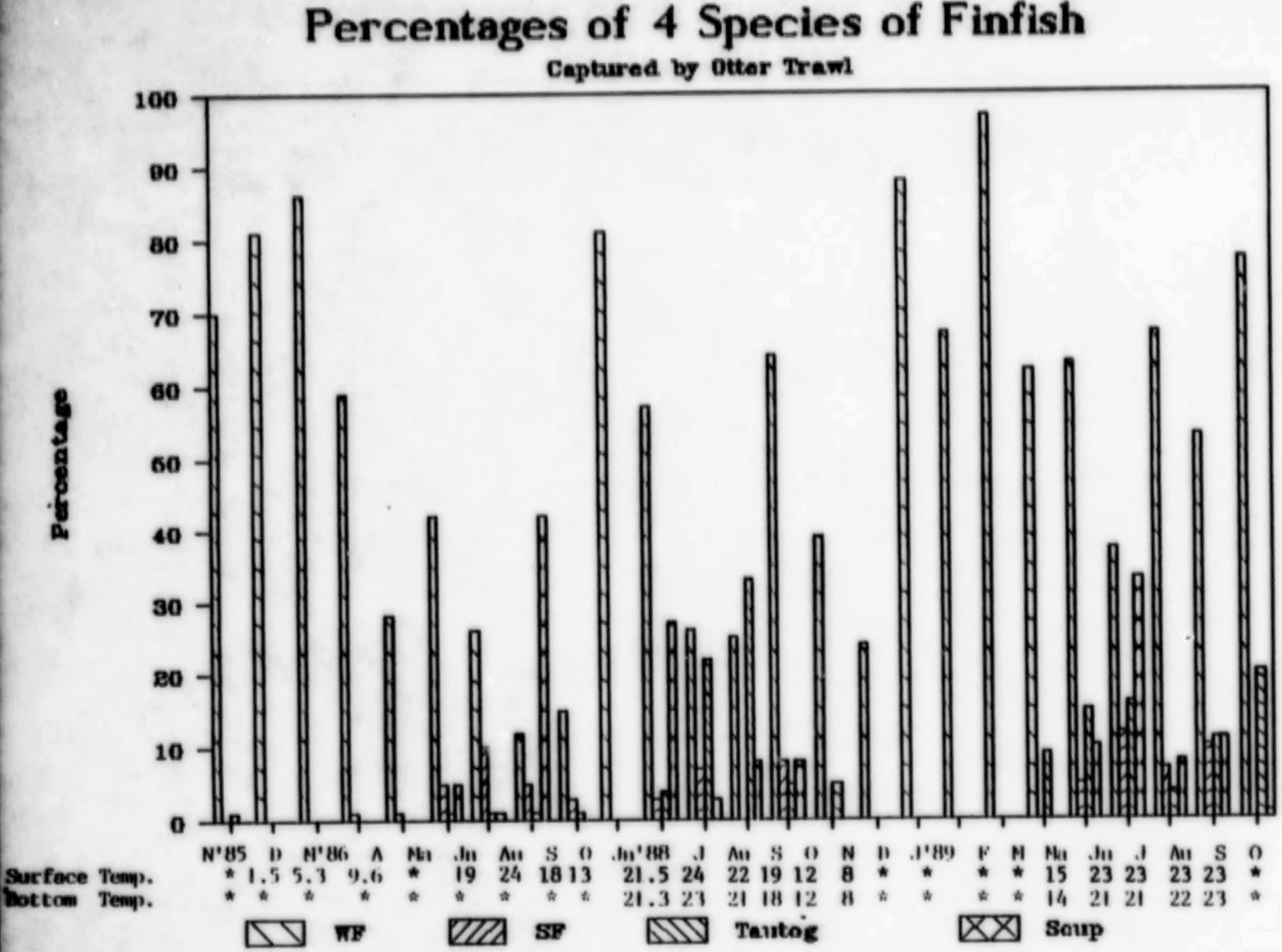

Percentages of 4 Species of Finfish
Captured by Otter Trawl
Percentage
100
90
80
70
60
50
40
30
20
10
0
N'85 D N'86 A Ma Jn Au S O Jn'88 J Au S O N D J'89 F M Ma Jn J Au S O
Surface Temp. * 1.5 5.3 9.6 * 19 24 18 13 21.5 24 22 19 12 8 * * * * 15 23 23 23 23 *
Bottom Temp. * * * * * * * * * 21.3 23 21 18 12 8 * * * * 14 21 21 22 23 *
WF
SF
Tautog
Scup

Figure 12

Catch Percentage for 6 Species

of Finfish by Gill Net in Jamaica Bay

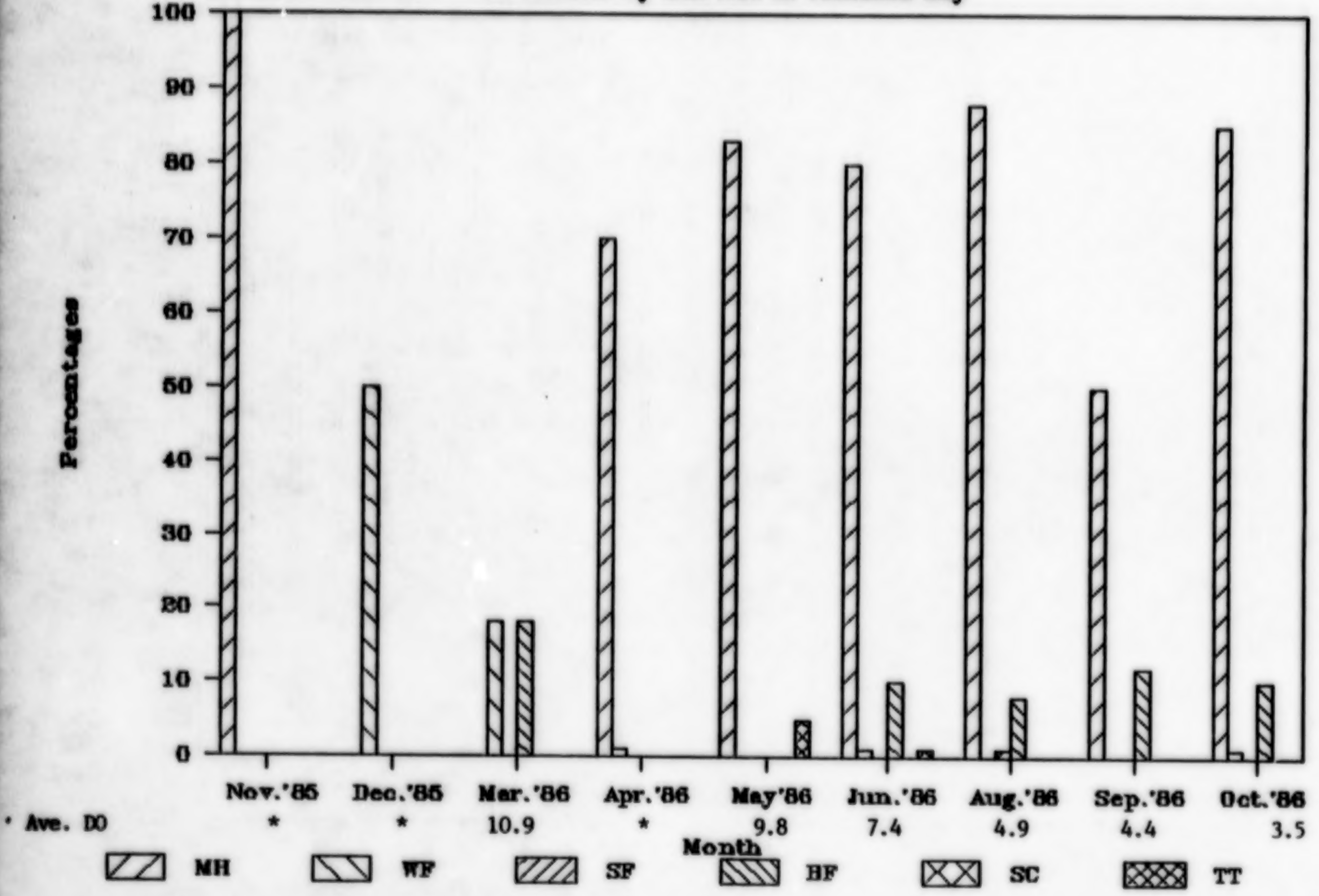


Figure 13

Percentages of 4 Species of Finfish

Captured by Otter Trawl

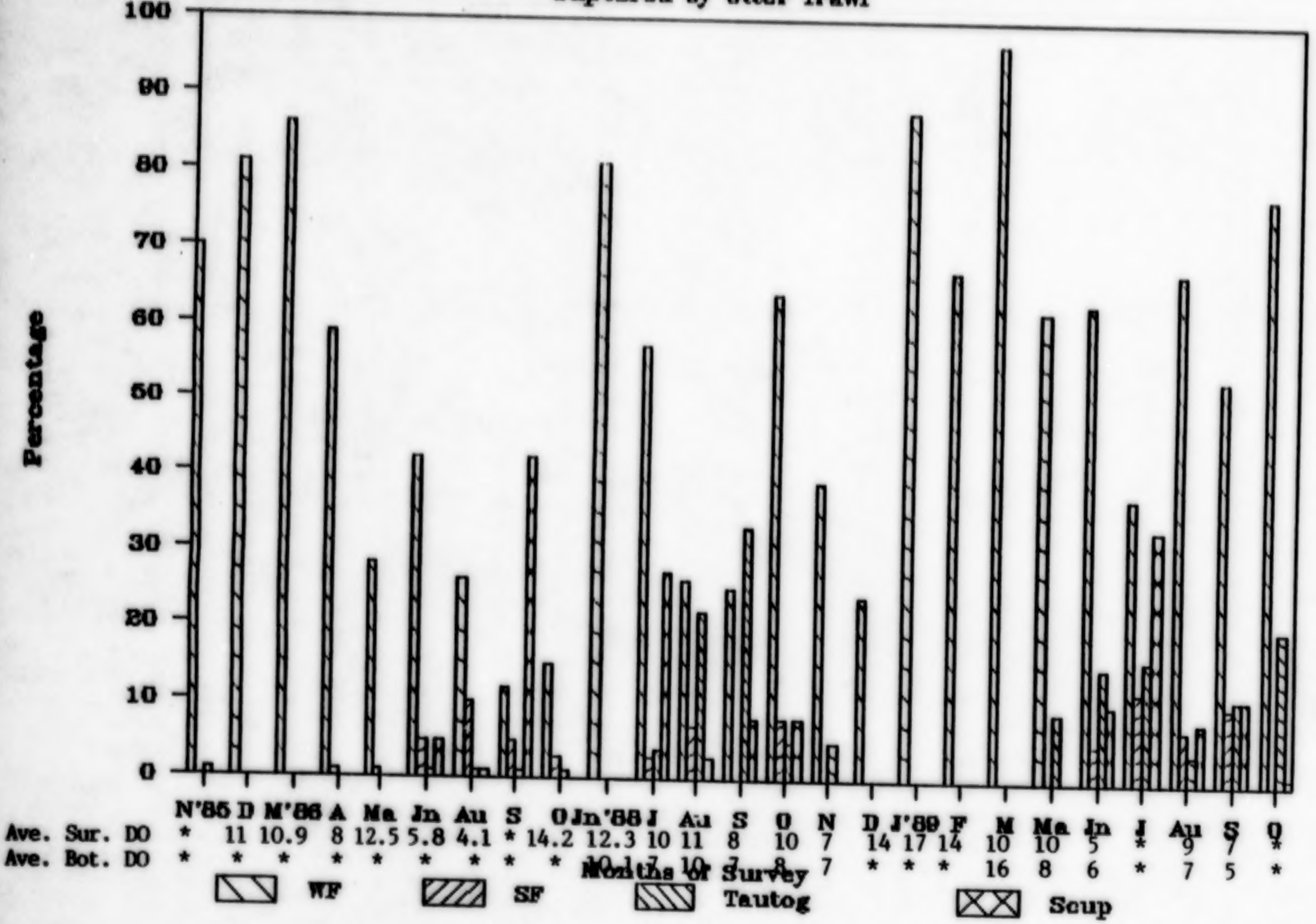
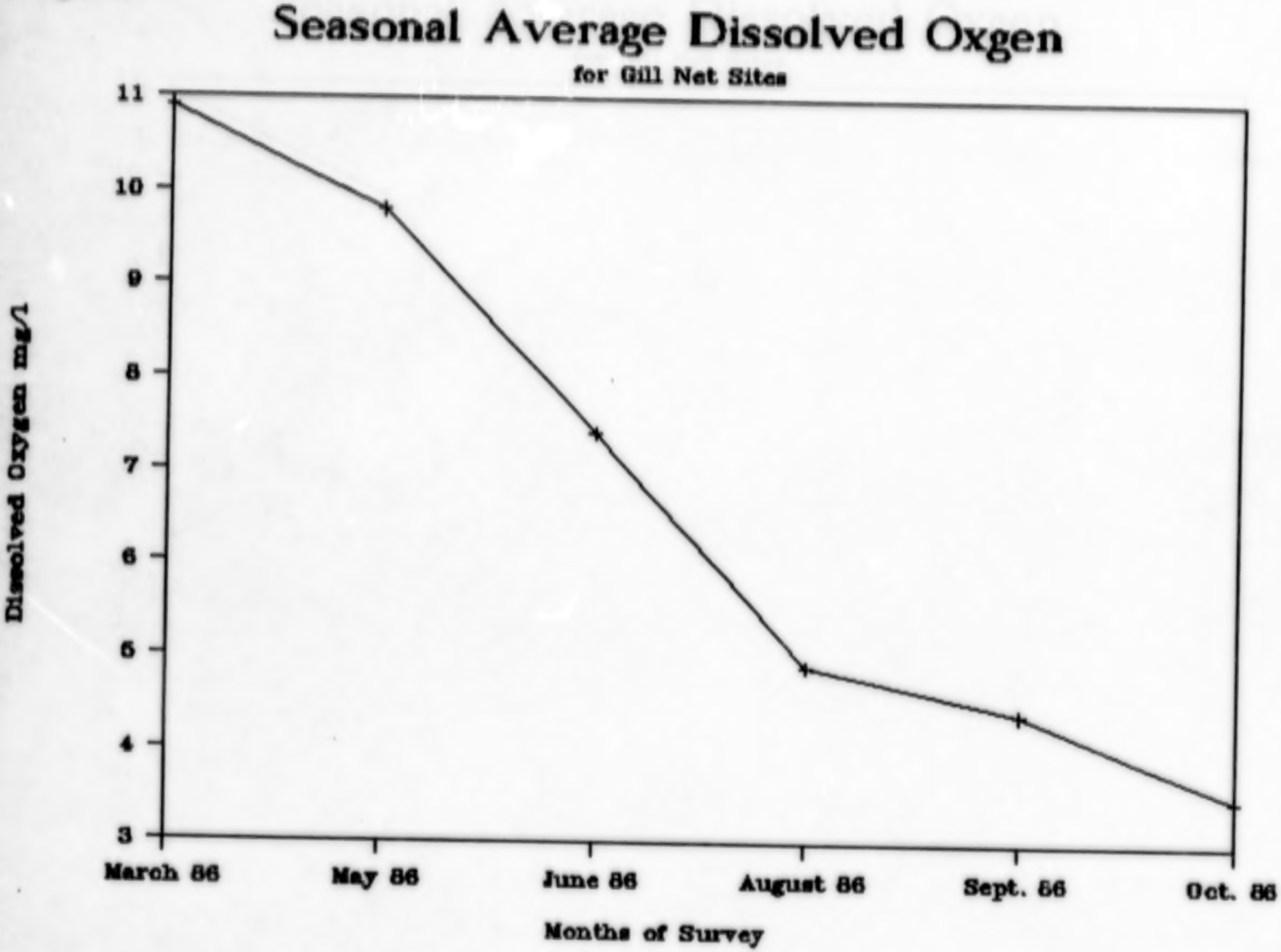


Figure 14



Seasonal Average Dissolved Oxgen
for Gill Net Sites
Dissolved Oxygen mg/l
11
10
9
8
7
6
5
4
3
March 86
May 86
June 86
August 86
Sept. 86
Oct. 86
Months of Survey

Figure 15

Seasonal Average For Dissolved Oxygen

for Trawl Sites

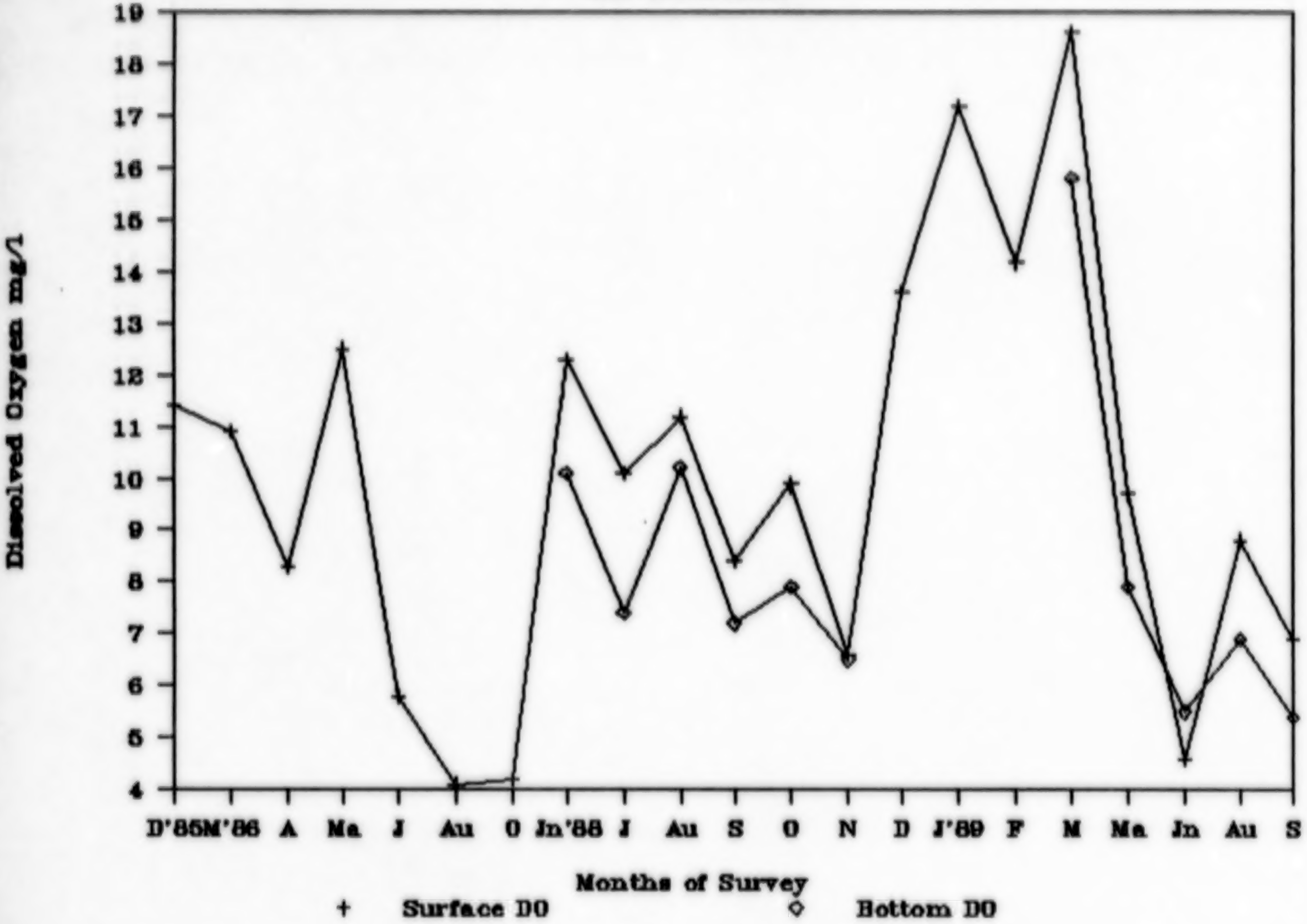


Figure 16

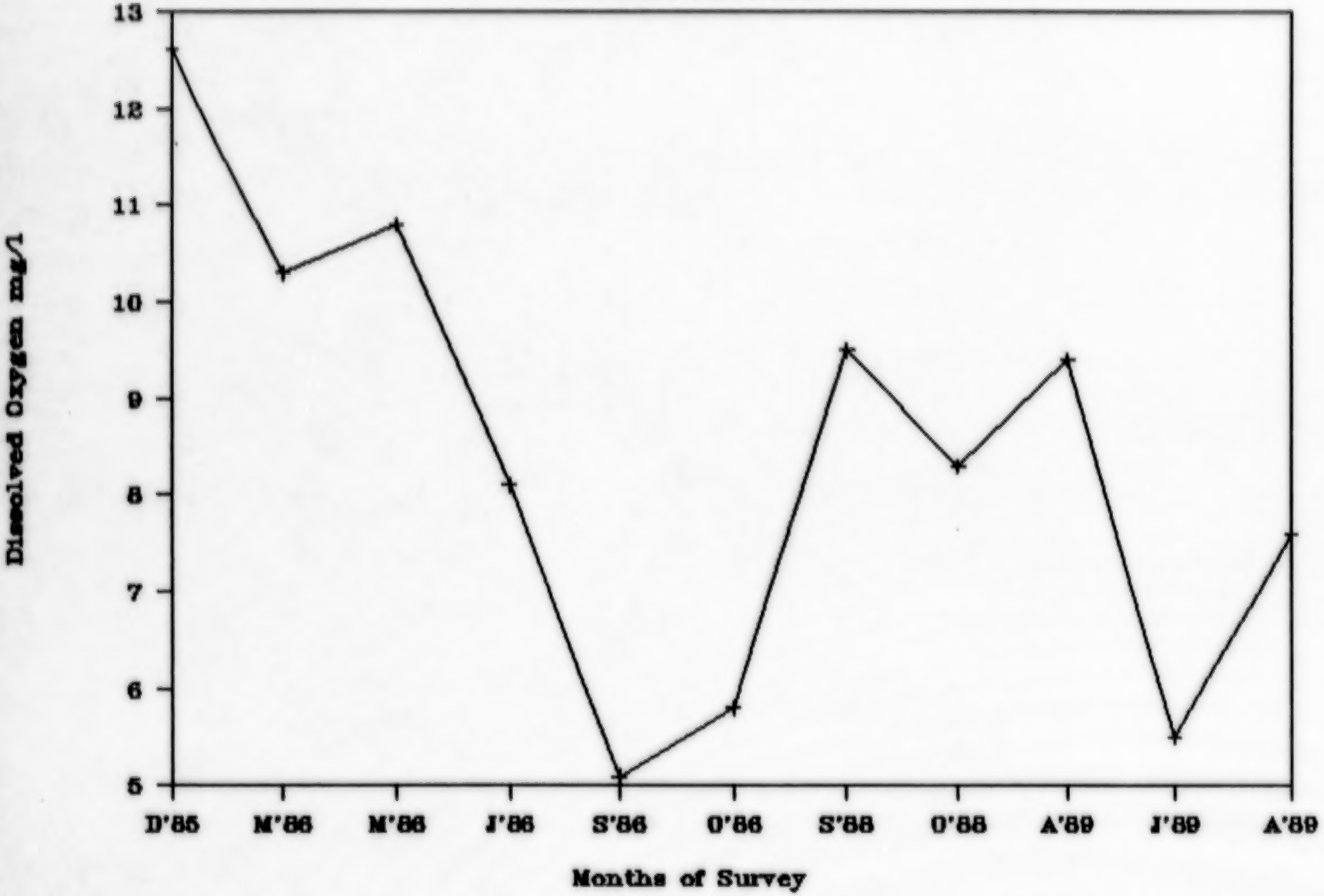
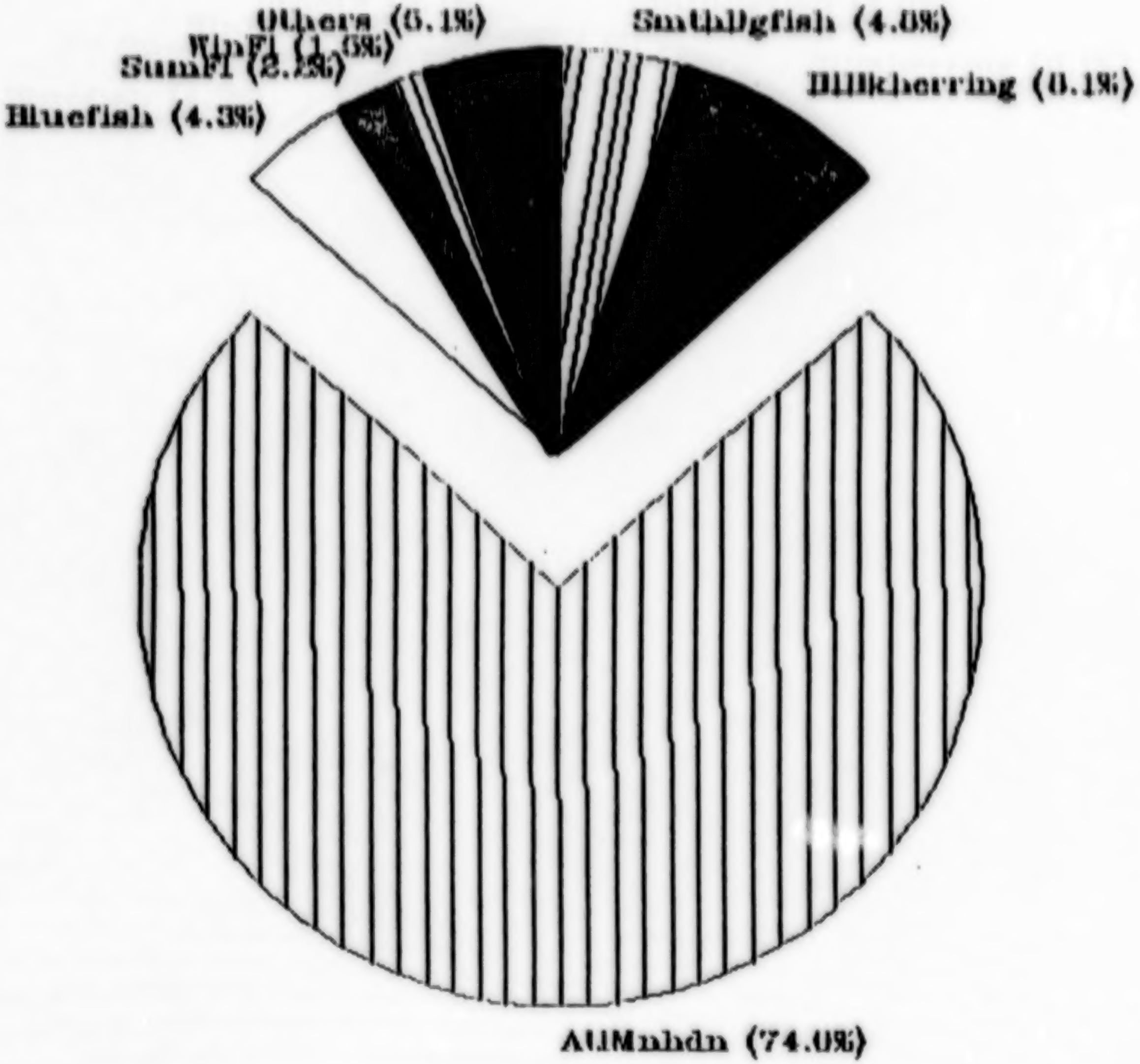

Seasonal Average Dissolved Oxygen
for Beach Seine Sites
Dissolved Oxygen mg/l
13
12
11
10
9
8
7
6
5
D'85
M'86
M'86
J'86
S'86
O'86
S'88
O'88
A'89
J'89
A'89
Months of Survey

Figure 17

Total Species Captured by Gill Net

1985 to 1986



48

Figure 18

Total Species Captured by Trawl

1985 to 1986

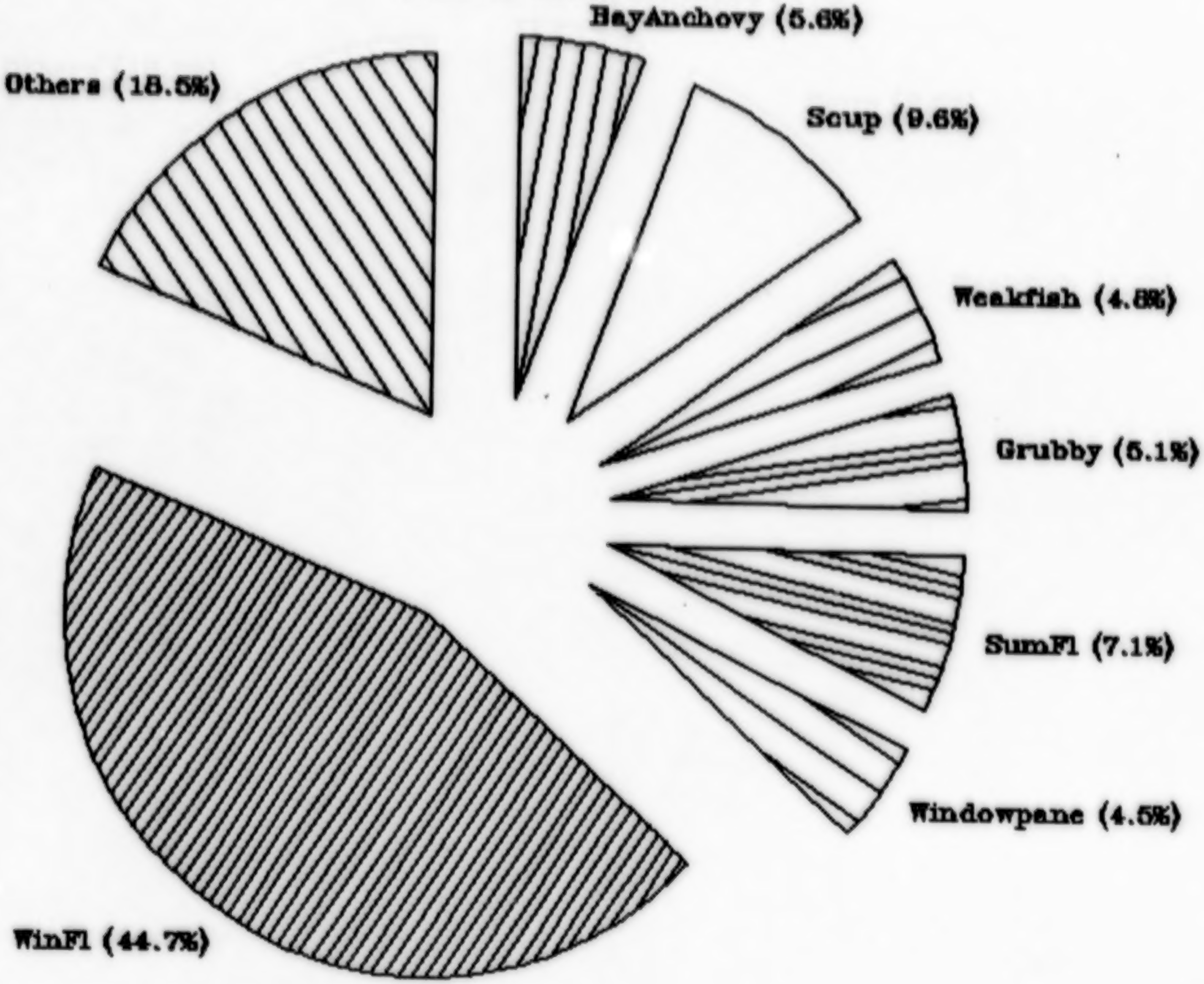


Figure 19

Total Species Captured by Trawl

1988 to 1989

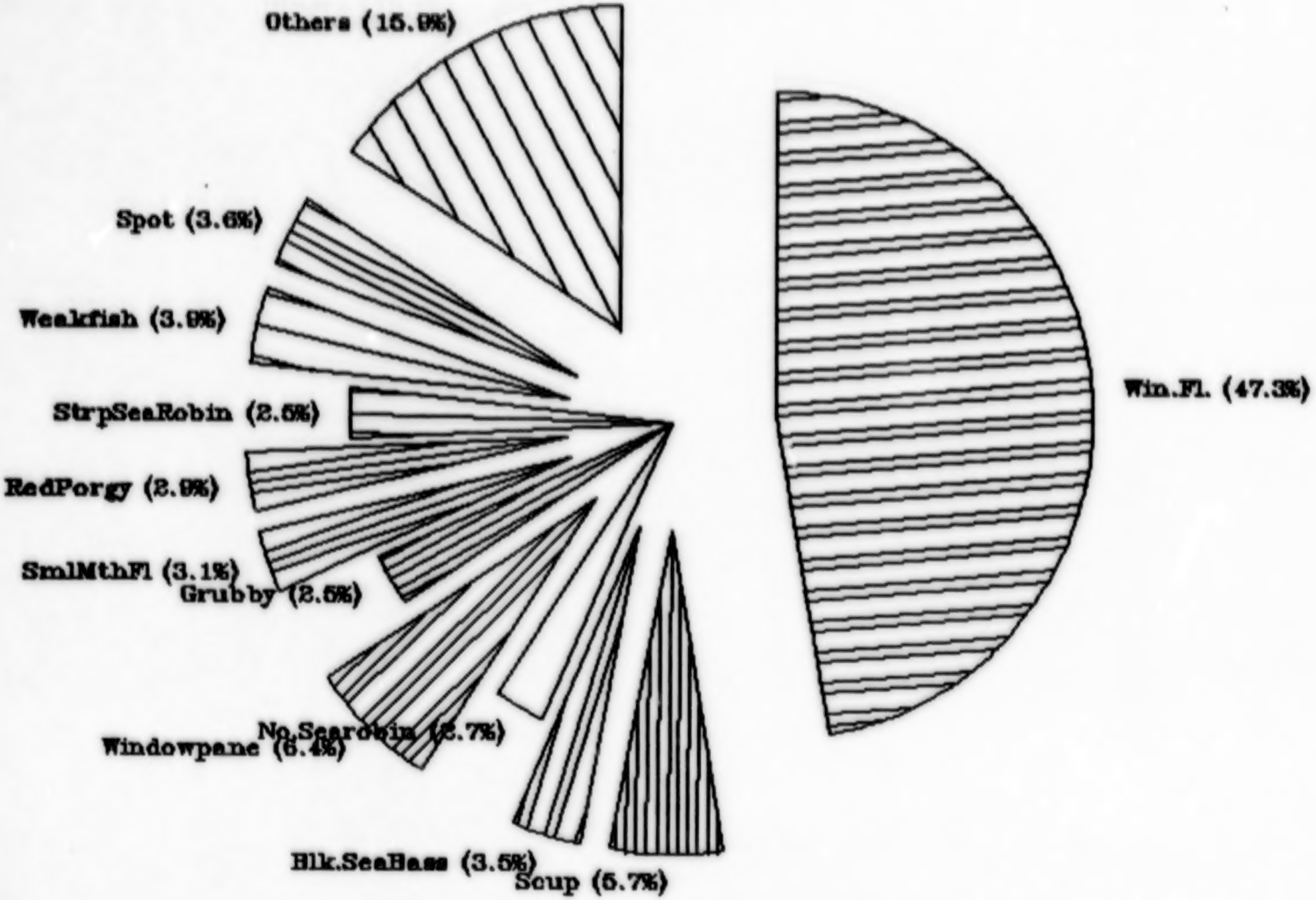


Figure 20

Total Species by Beach Seine

1985 to 1986

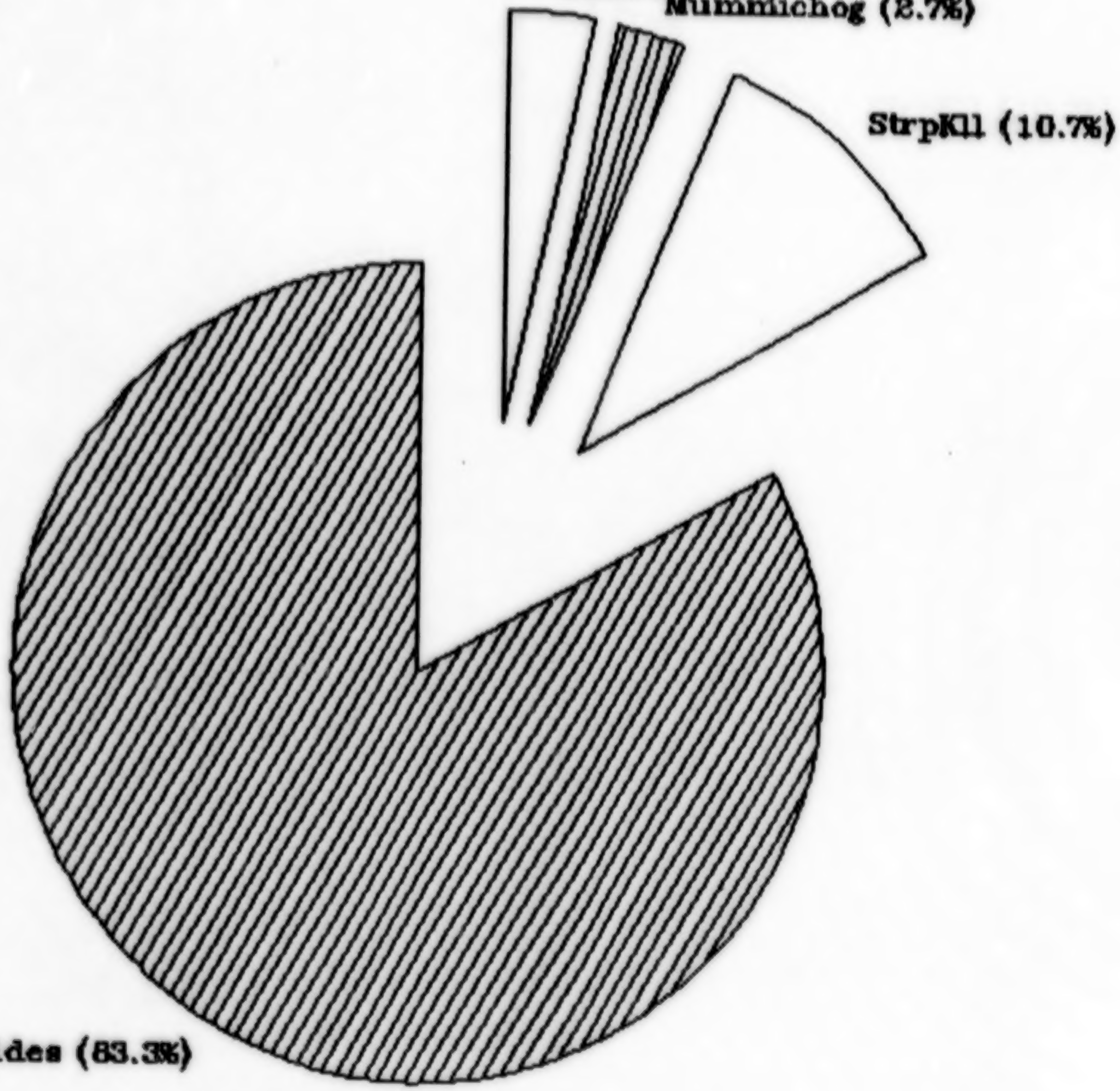


Figure 21

Total Species Captured by Beach Seine

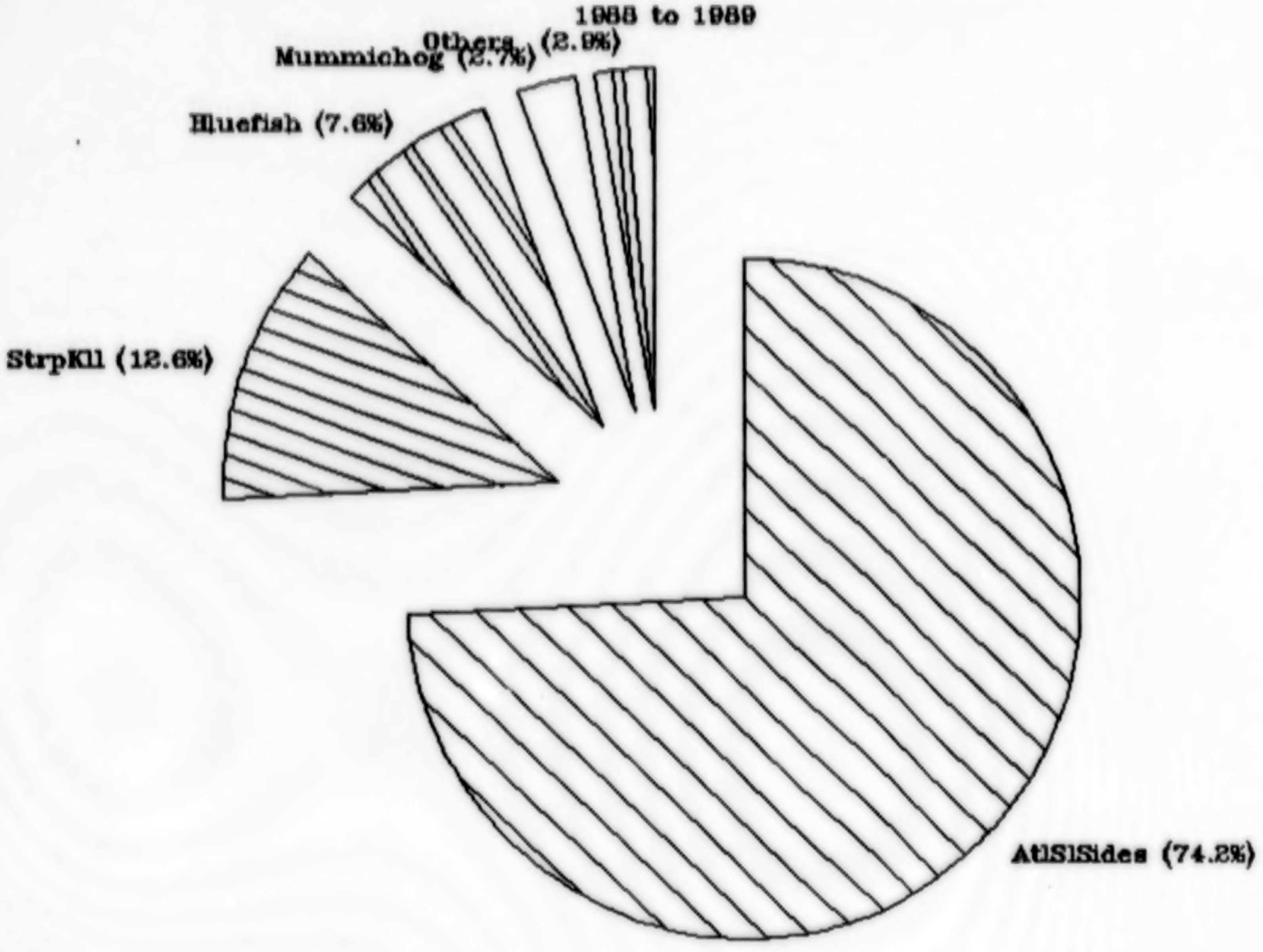
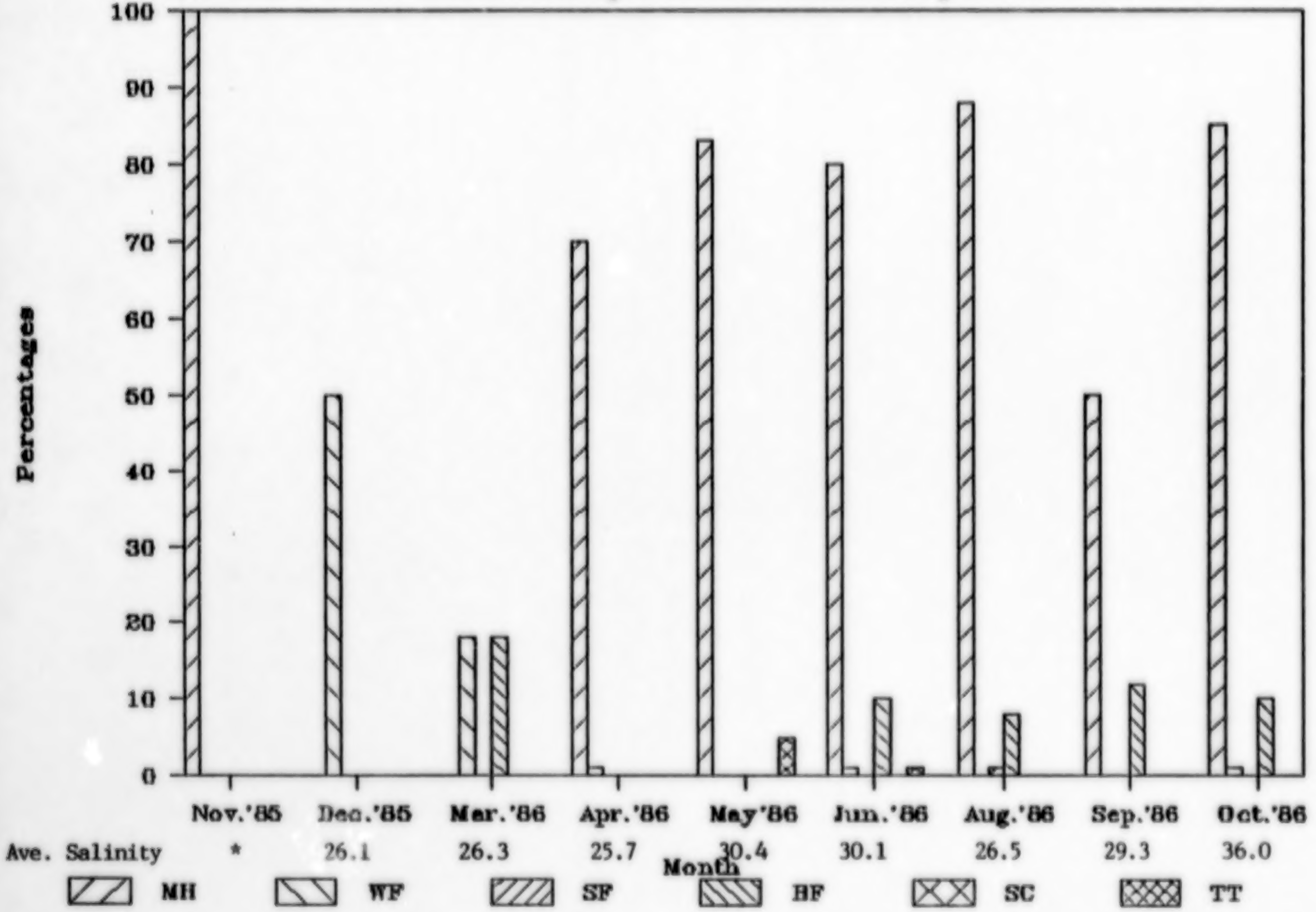


Figure 22



Catch Percentage for 6 Species
of Finfish by Gill Net in Jamaica Bay

Figure 23

Percentages of 4 Species of Finfish

Captured by Otter Trawl

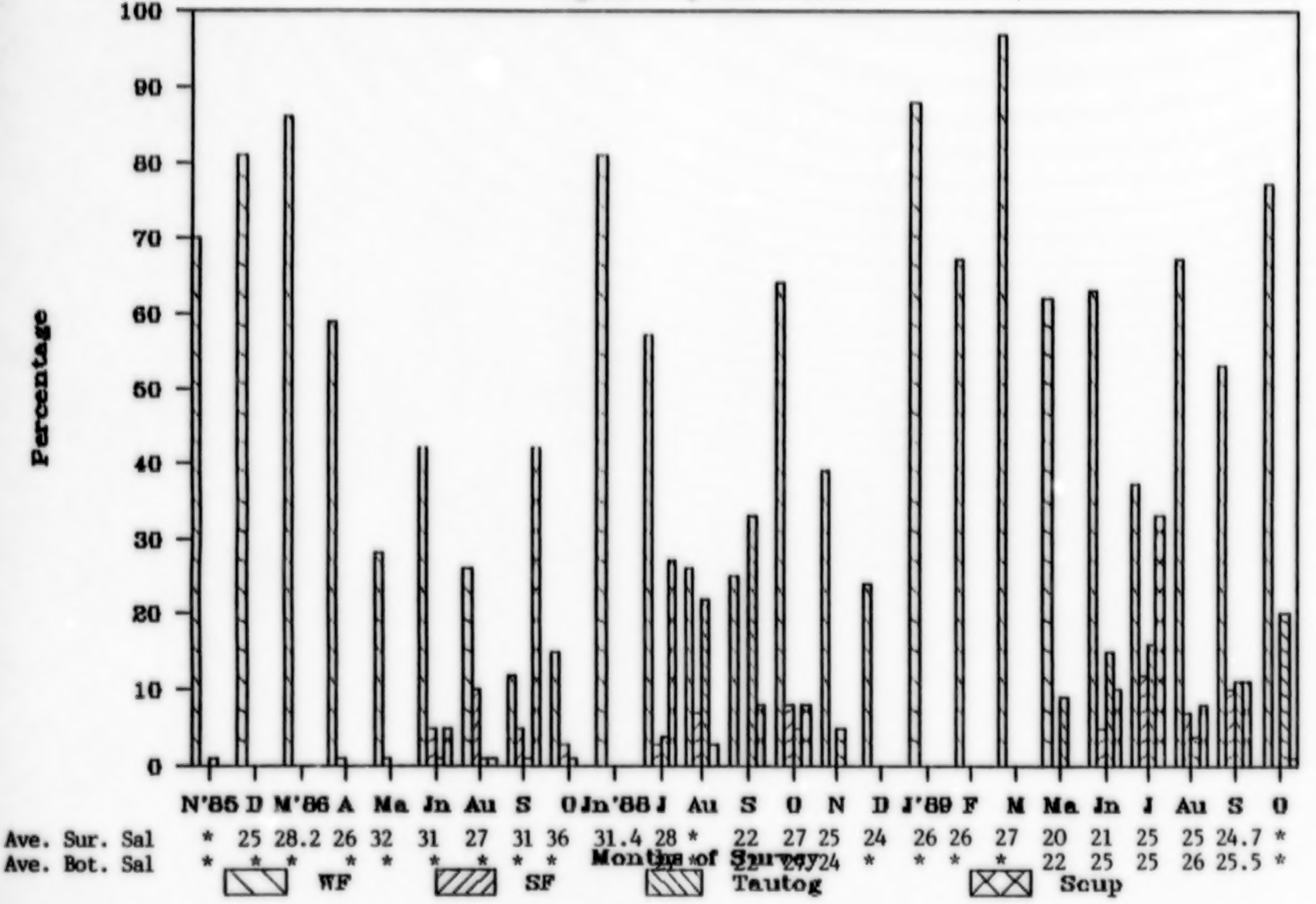


Figure 24

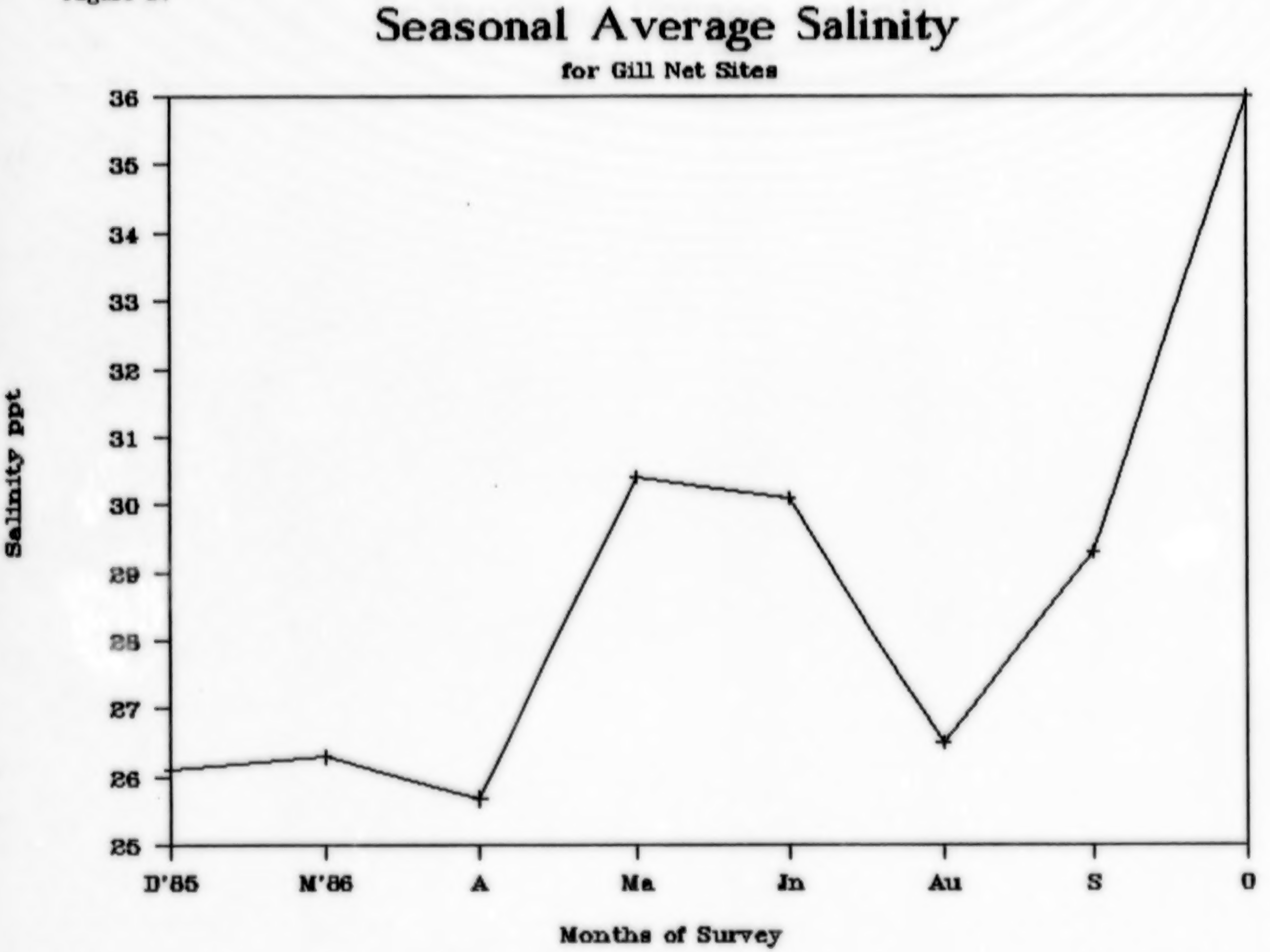

Seasonal Average Salinity
for Gill Net Sites
Salinity ppt
36
35
34
33
32
31
30
29
28
27
26
25
D'85
M'86
A
Ma
Jn
Au
S
O
Months of Survey

Figure 25

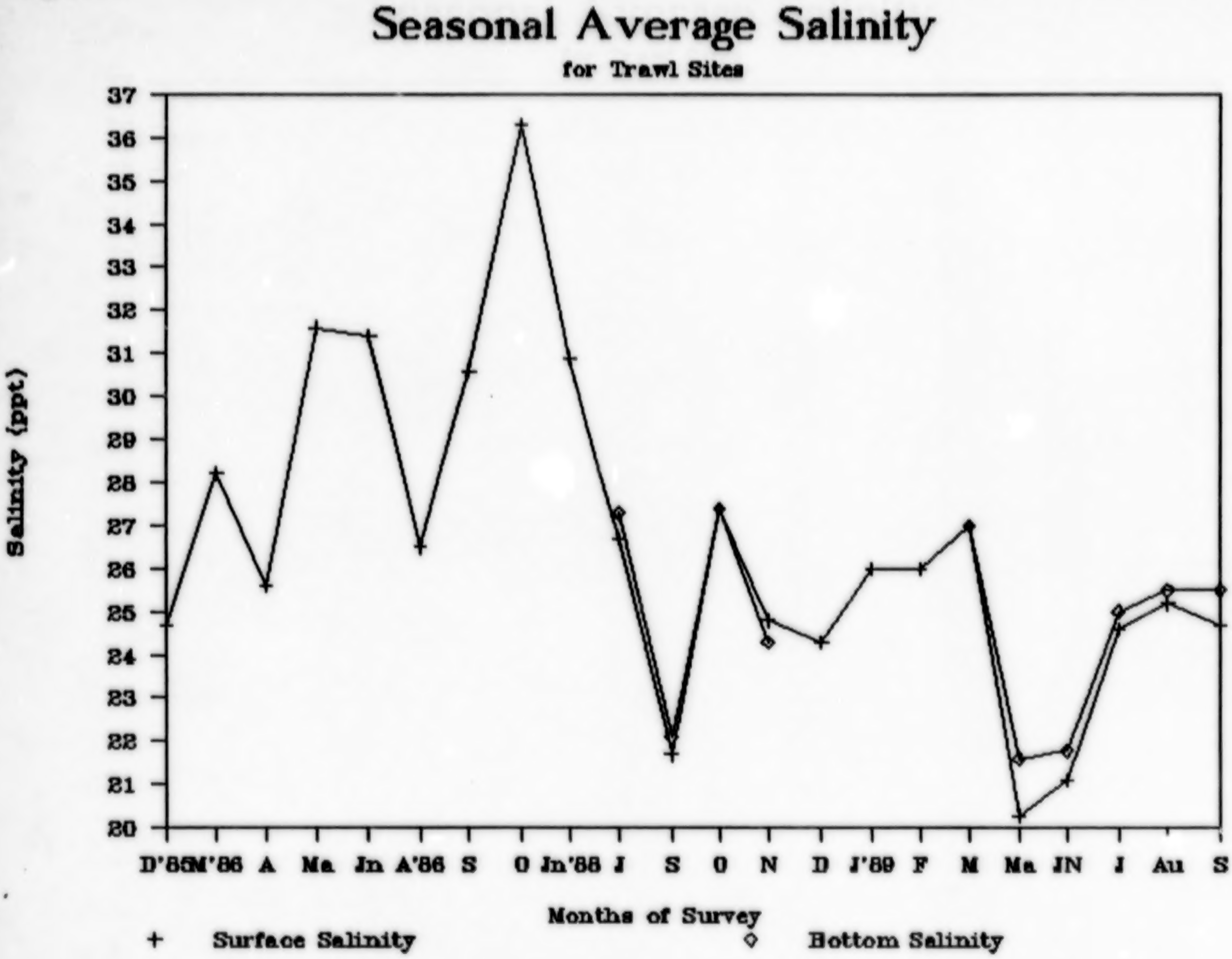
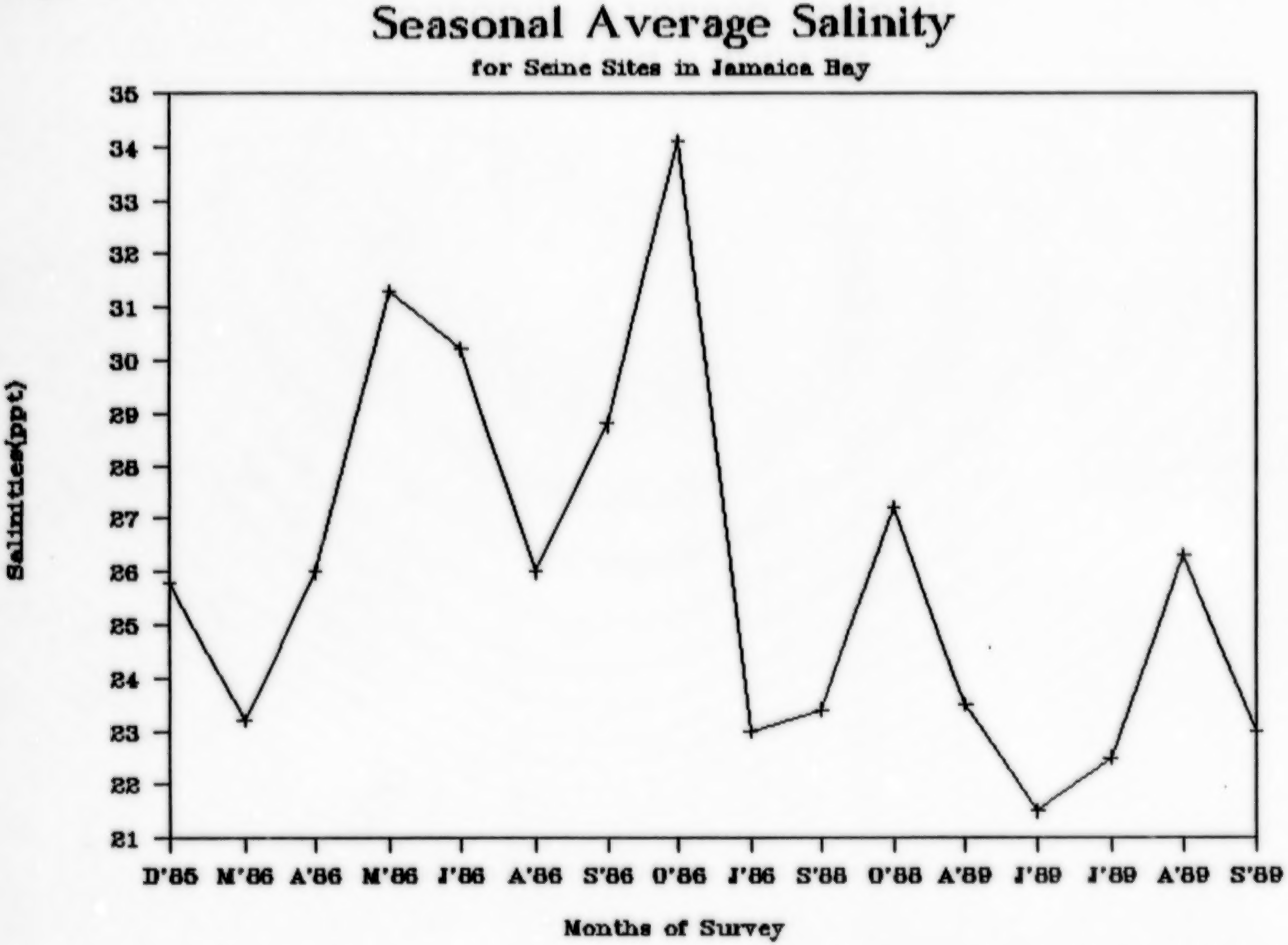

Seasonal Average Salinity
for Trawl Sites
Salinity (ppt)
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
D'85
M'86
A
Ma
Jn
A'86
S
O
Jn'88
J
S
O
N
D
J'89
F
M
Ma
JN
J
Au
S
Months of Survey
+ Surface Salinity
◇ Bottom Salinity

Figure 26



Seasonal Average Salinity

for Seine Sites in Jamaica Bay

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PAGE

Figure 27

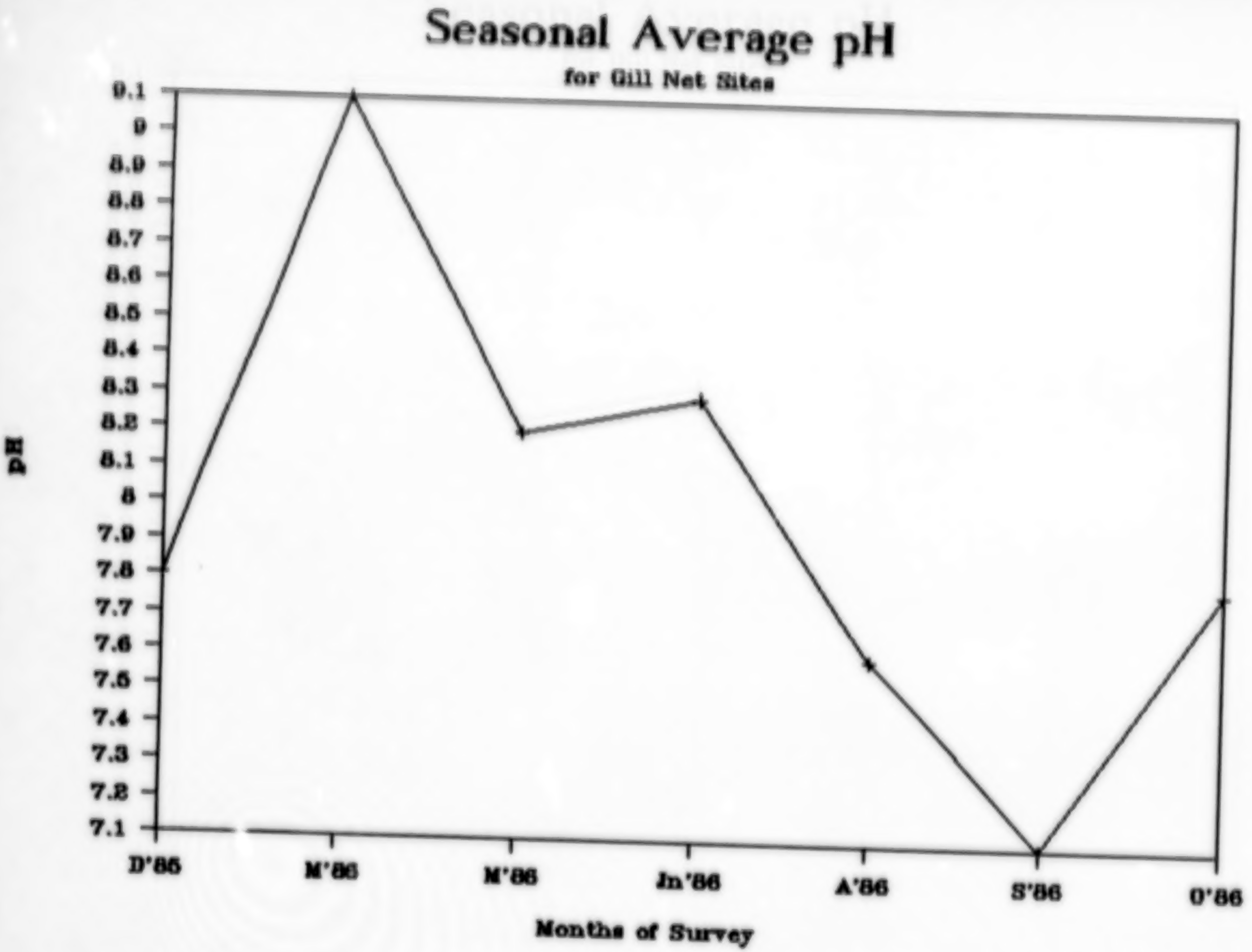

Seasonal Average pH
for Gill Net Sites
pH
9.1
9
8.9
8.8
8.7
8.6
8.5
8.4
8.3
8.2
8.1
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
D'85
M'86
M'86
Jn'86
A'86
S'86
O'86
Months of Survey

Figure 28

Seasonal Average pH

for Trawl Sites

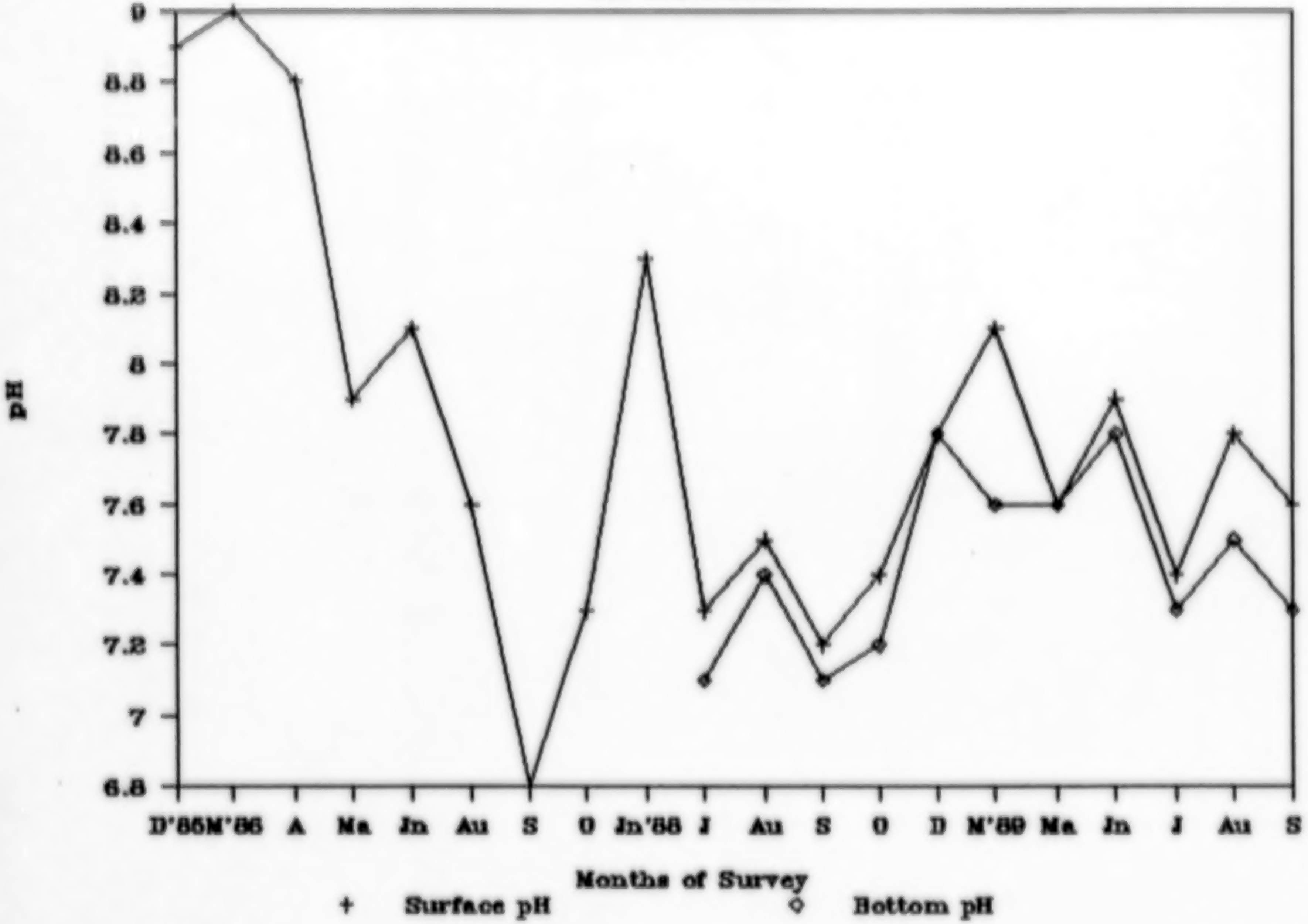


Figure 29

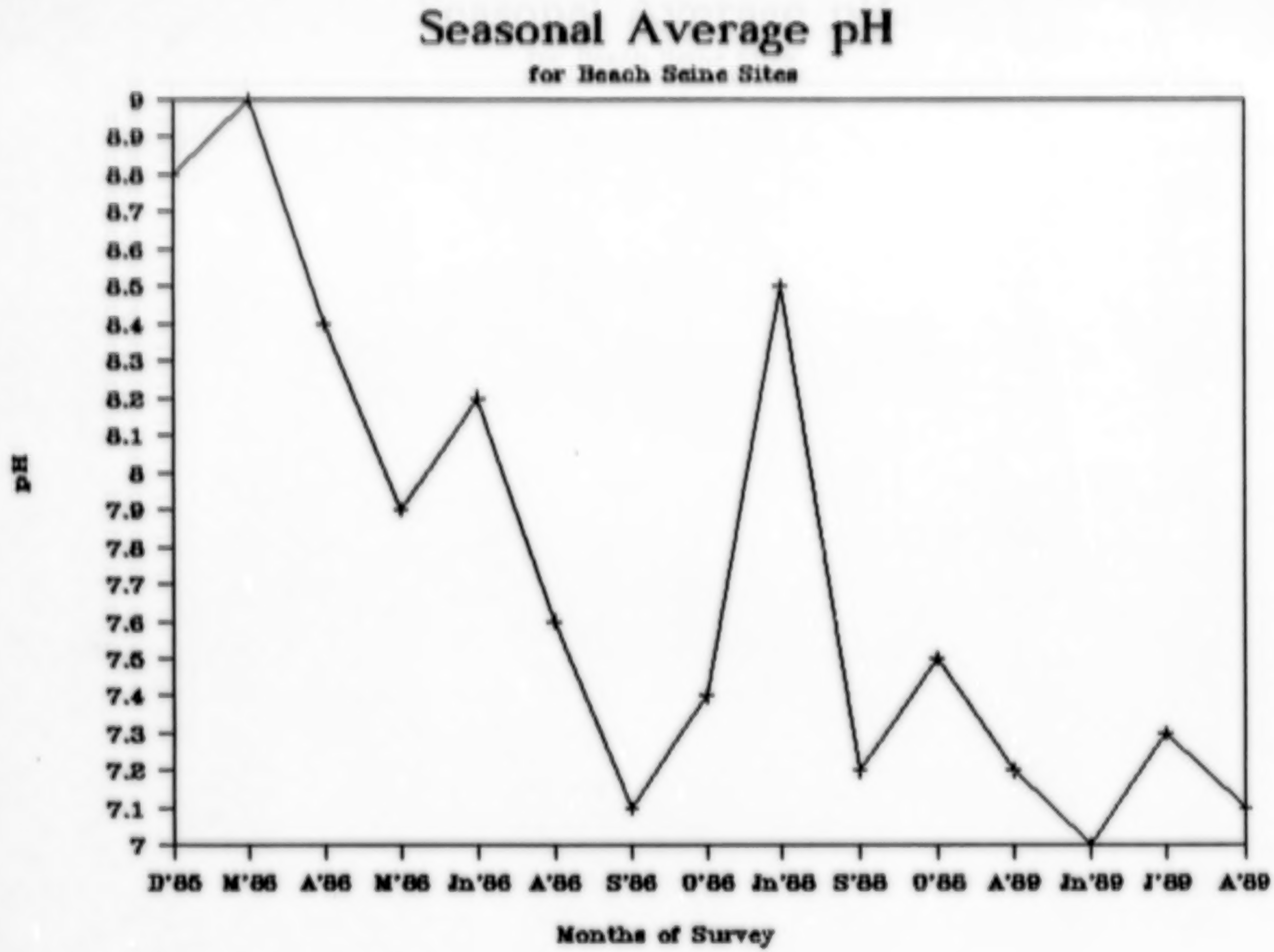

Seasonal Average pH
for Beach Seine Sites
pH
9
8.9
8.8
8.7
8.6
8.5
8.4
8.3
8.2
8.1
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7
D'85
M'86
A'86
M'86
Jn'86
A'86
S'86
O'86
Jn'88
S'88
O'88
A'89
Jn'89
J'89
A'89
Months of Survey

Figure 30

Seasonal Average of Chlorophyll a

for Trawl Sites

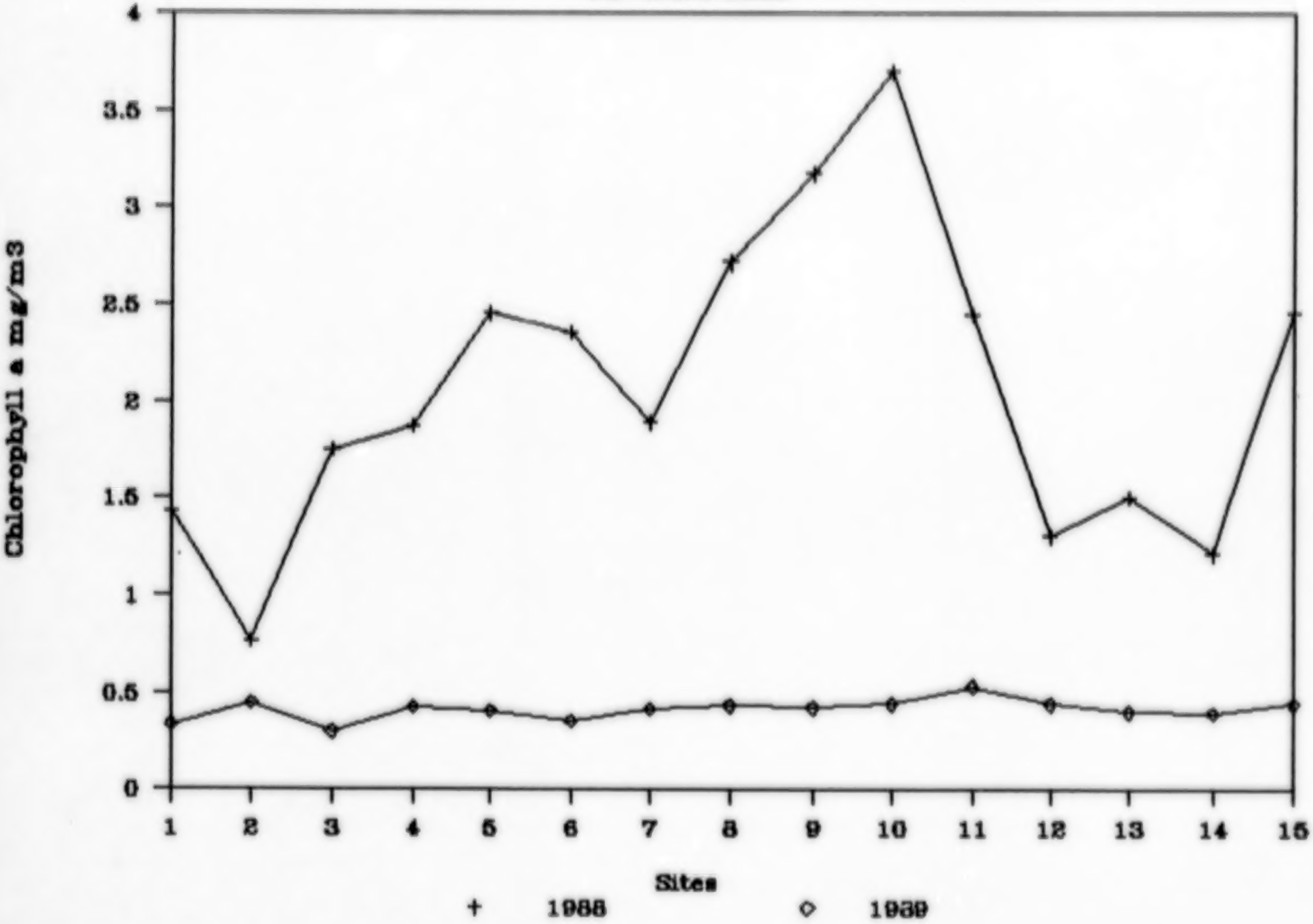


Figure 31

Percentage of 4 Species

of Fishfish Captured by Trawl

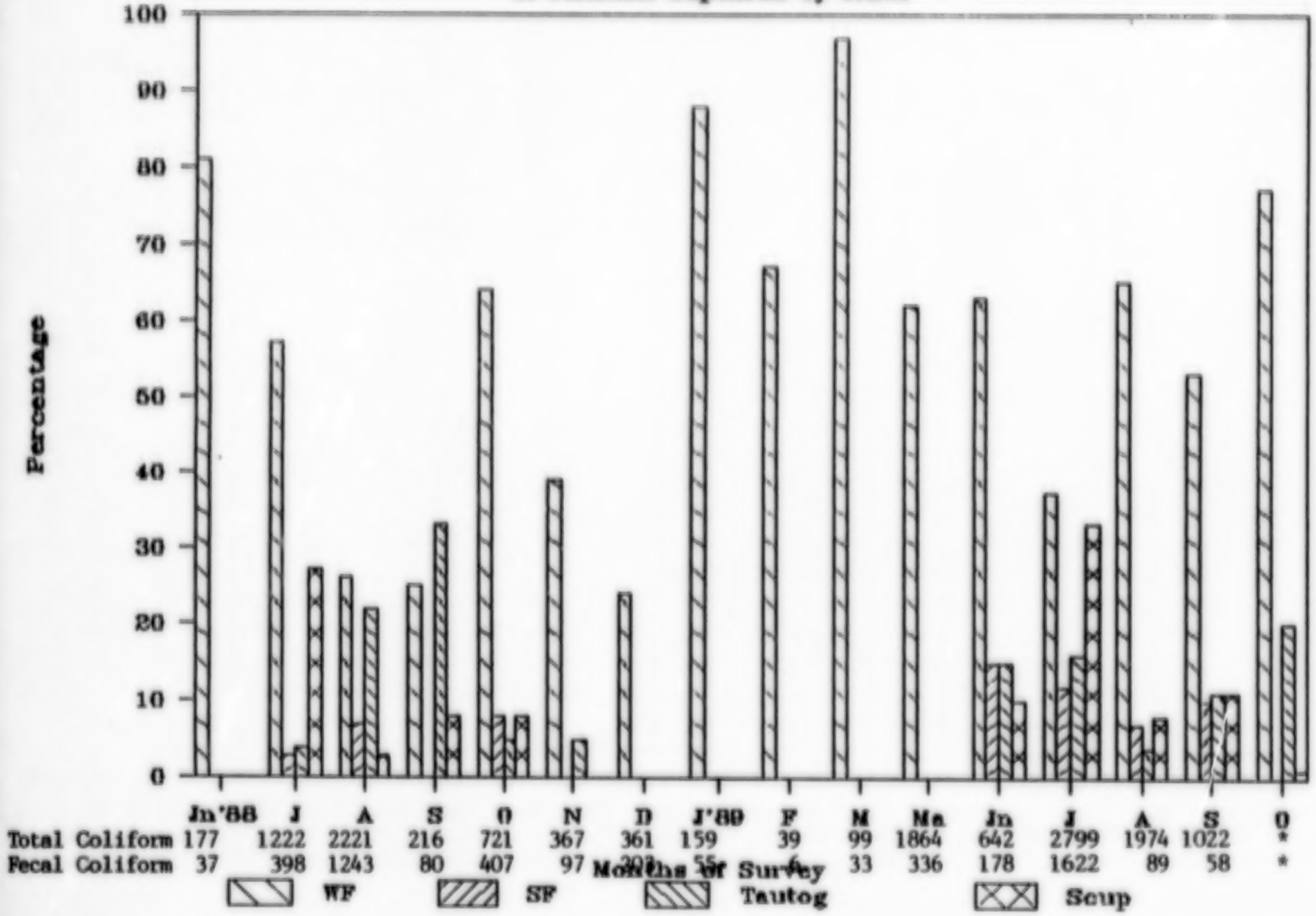


Figure 32

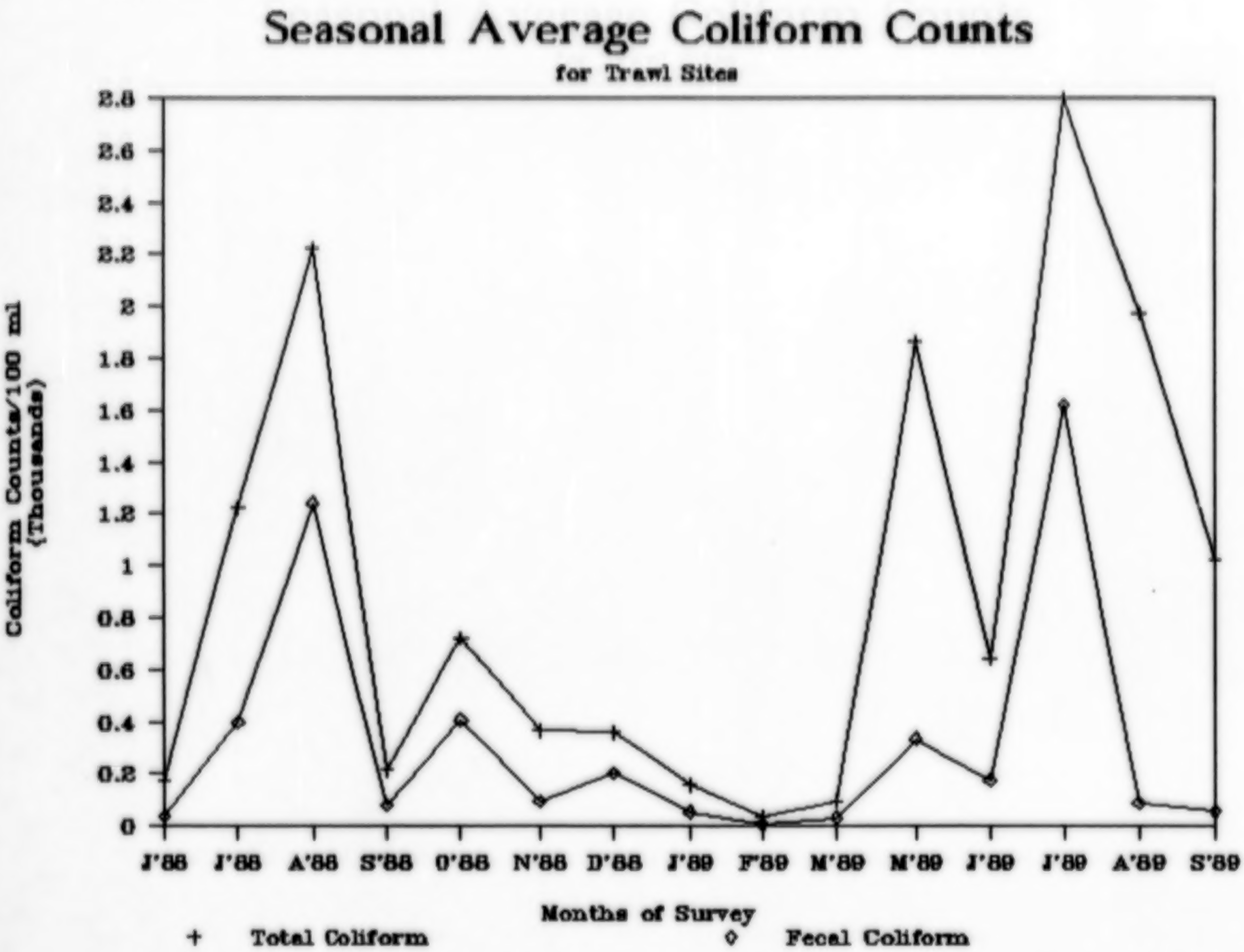

Seasonal Average Coliform Counts
for Trawl Sites
Coliform Counts/100 ml (Thousands)
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
J'88
J'88
A'88
S'88
O'88
N'88
D'88
J'89
F'89
M'89
M'89
J'89
J'89
A'89
S'89
Months of Survey
+ Total Coliform
◇ Fecal Coliform

Figure 33

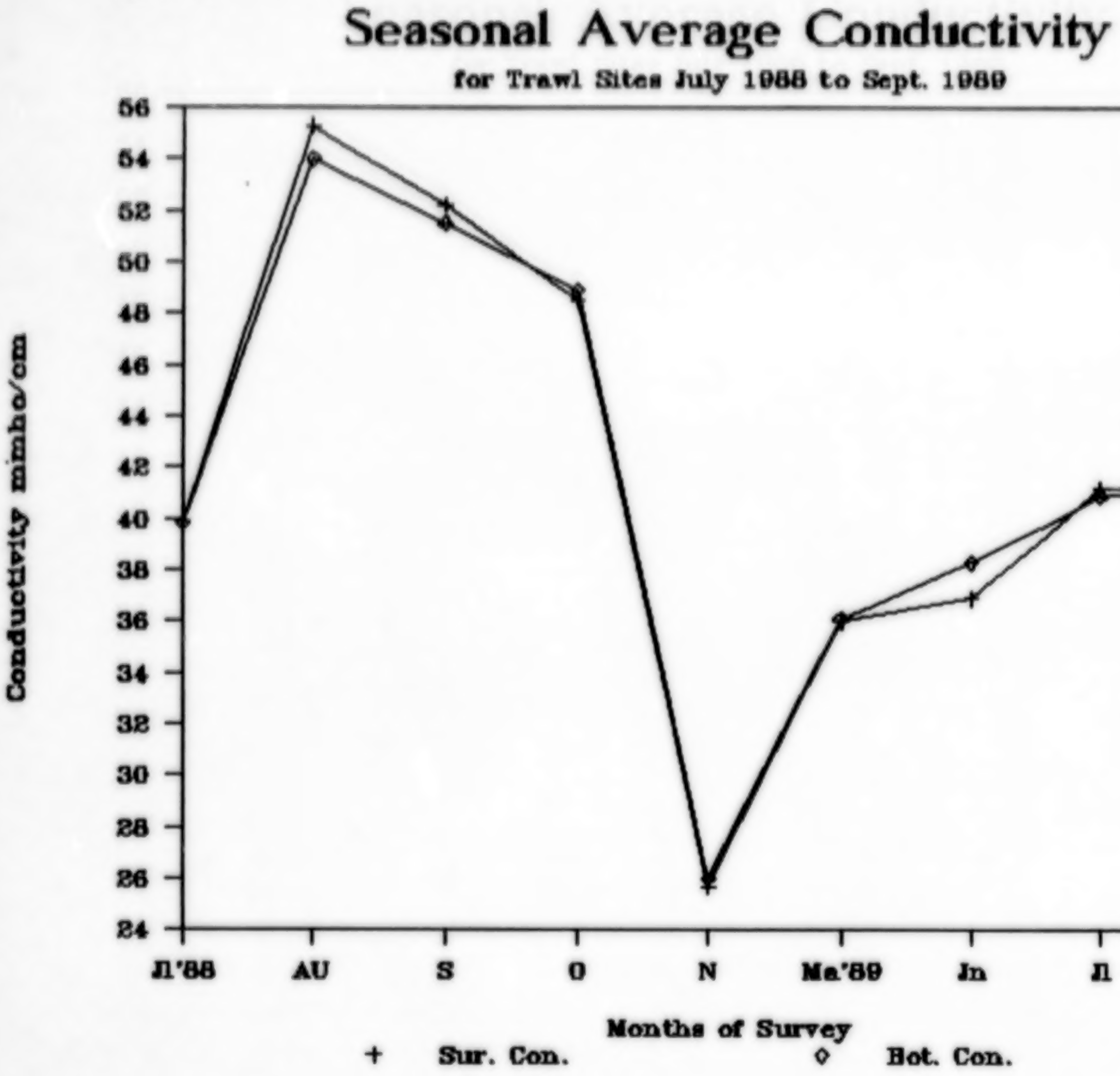
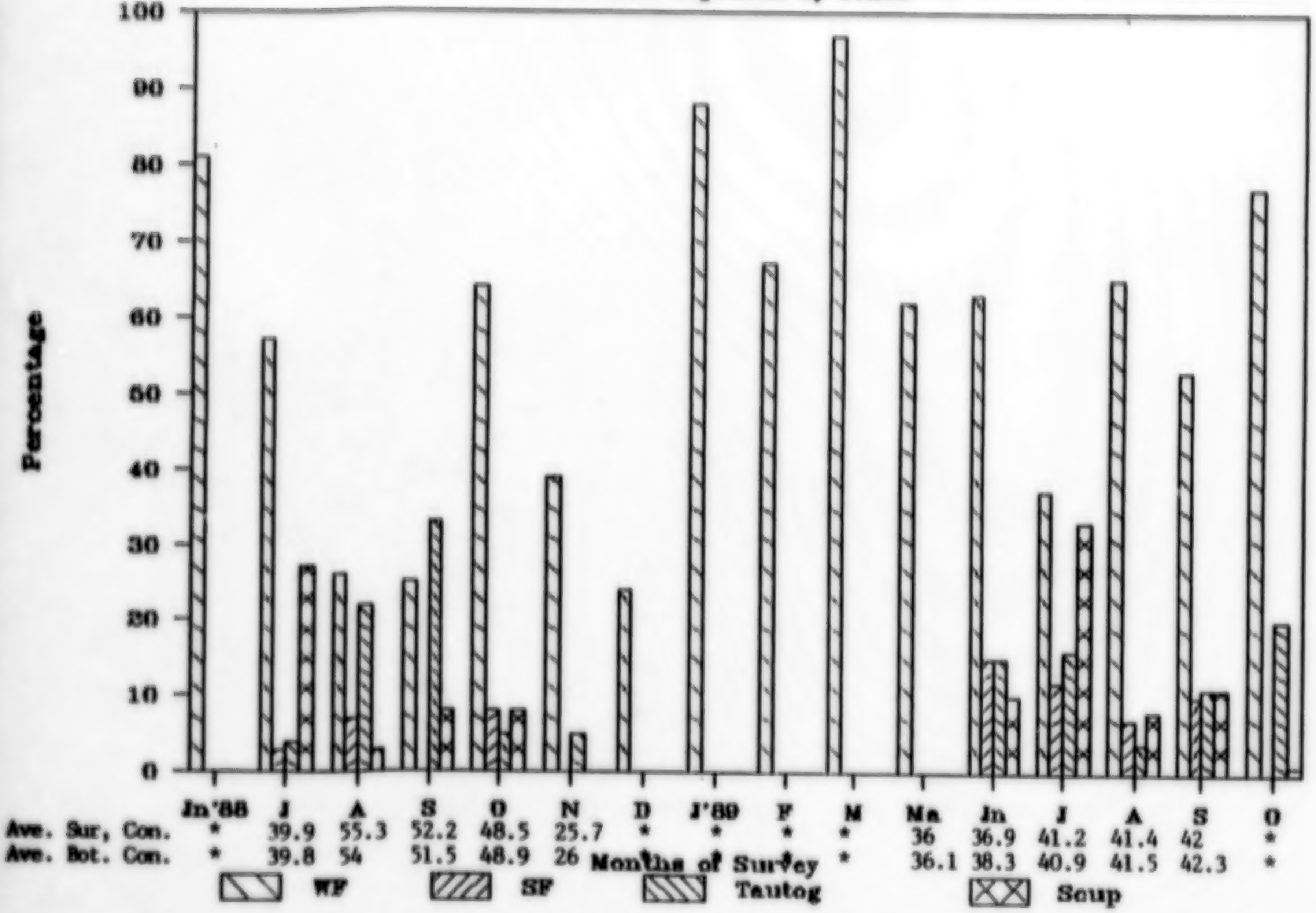

Seasonal Average Conductivity
for Trawl Sites July 1988 to Sept. 1989
Conductivity mimho/cm
56
54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
Jl'88
AU
S
O
N
Ma'89
Jn
Jl
Au
S
Months of Survey
+ Sur. Con.
◇ Bot. Con.

Figure 34



Percentage of 4 Species

of Fishfish Captured by Trawl

Figure 35

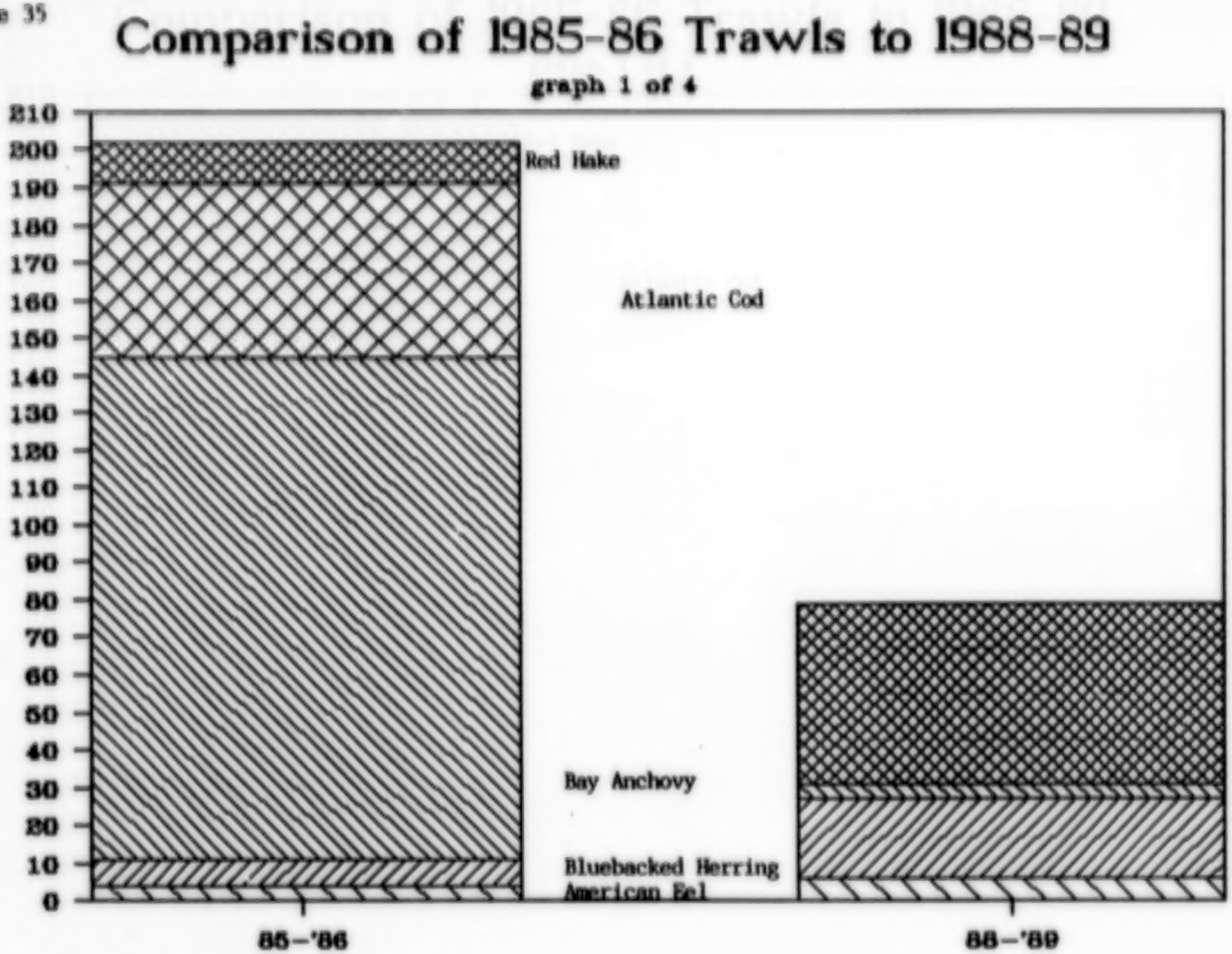

Comparison of 1985-86 Trawls to 1988-89
graph 1 of 4
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Red Hake
Atlantic Cod
Bay Anchovy
Bluebacked Herring
American Eel
85-'86
88-'89

Figure 36

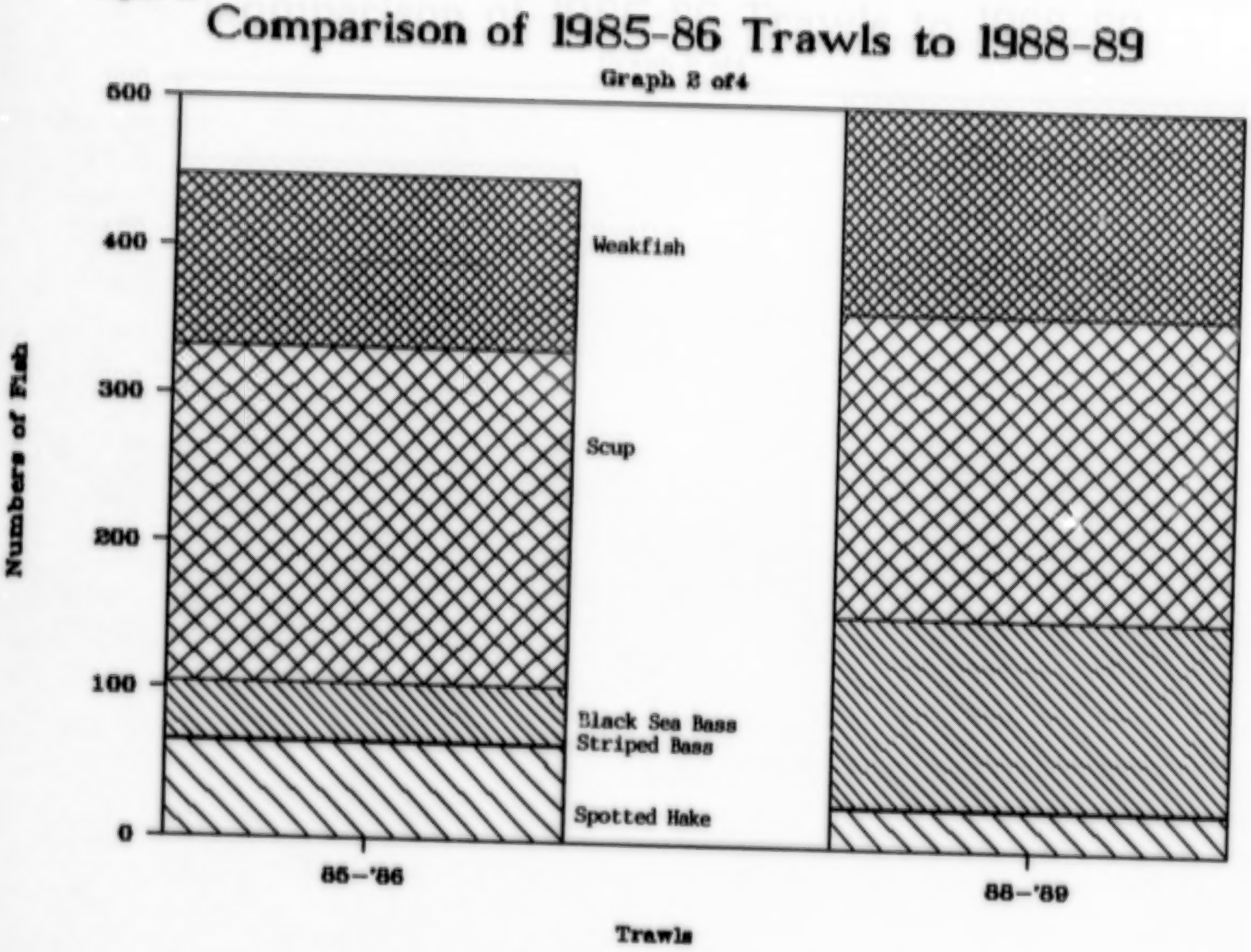

Comparison of 1985-86 Trawls to 1988-89
Graph 2 of4
600
400
300
200
100
0
Numbers of Fish
Weakfish
Scup
Black Sea Bass
Striped Bass
Spotted Hake
85-'86
88-'89
Trawls

Figure 37 Comparison of 1985-86 Trawls to 1988-89

Graph 3 of 4

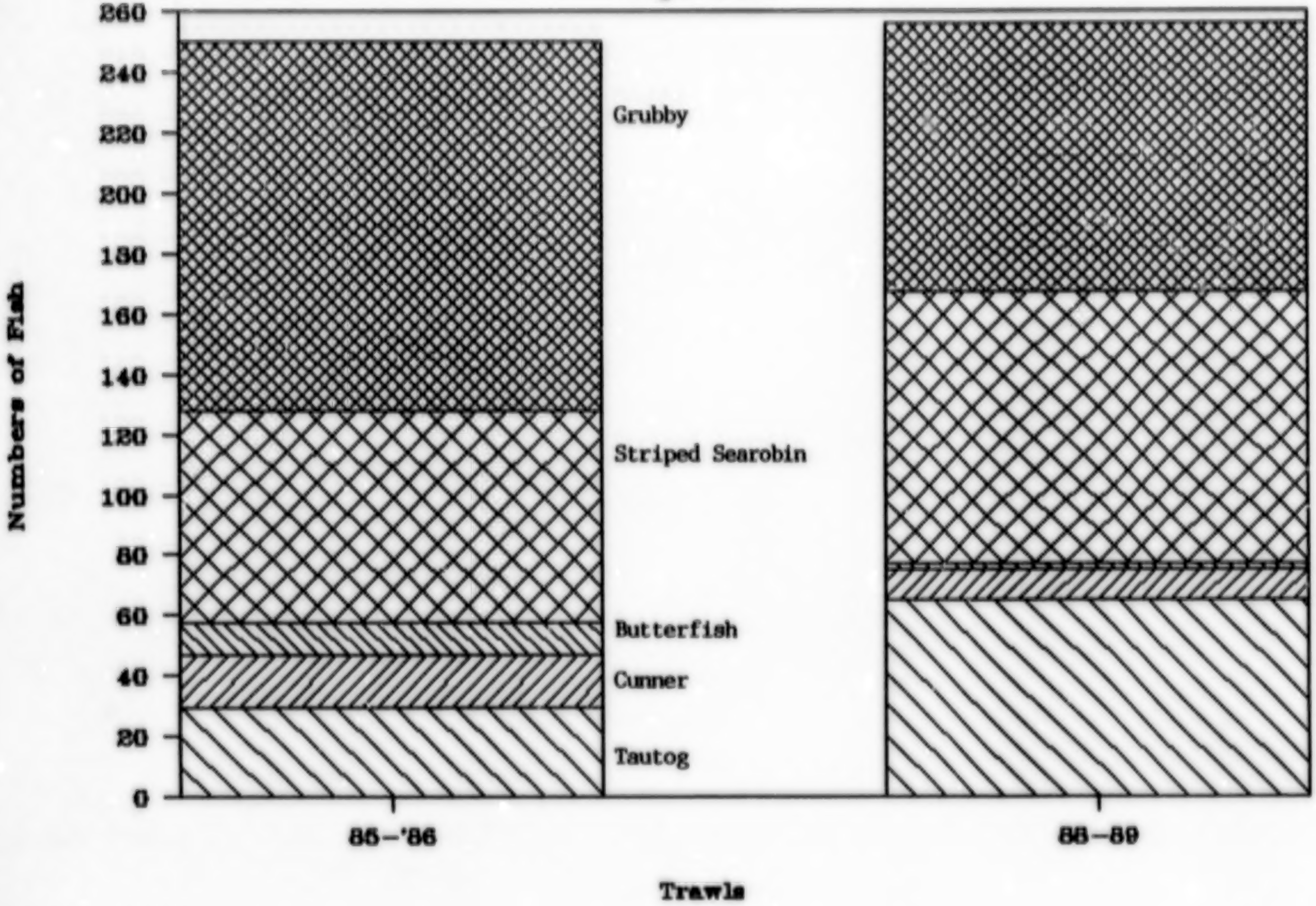
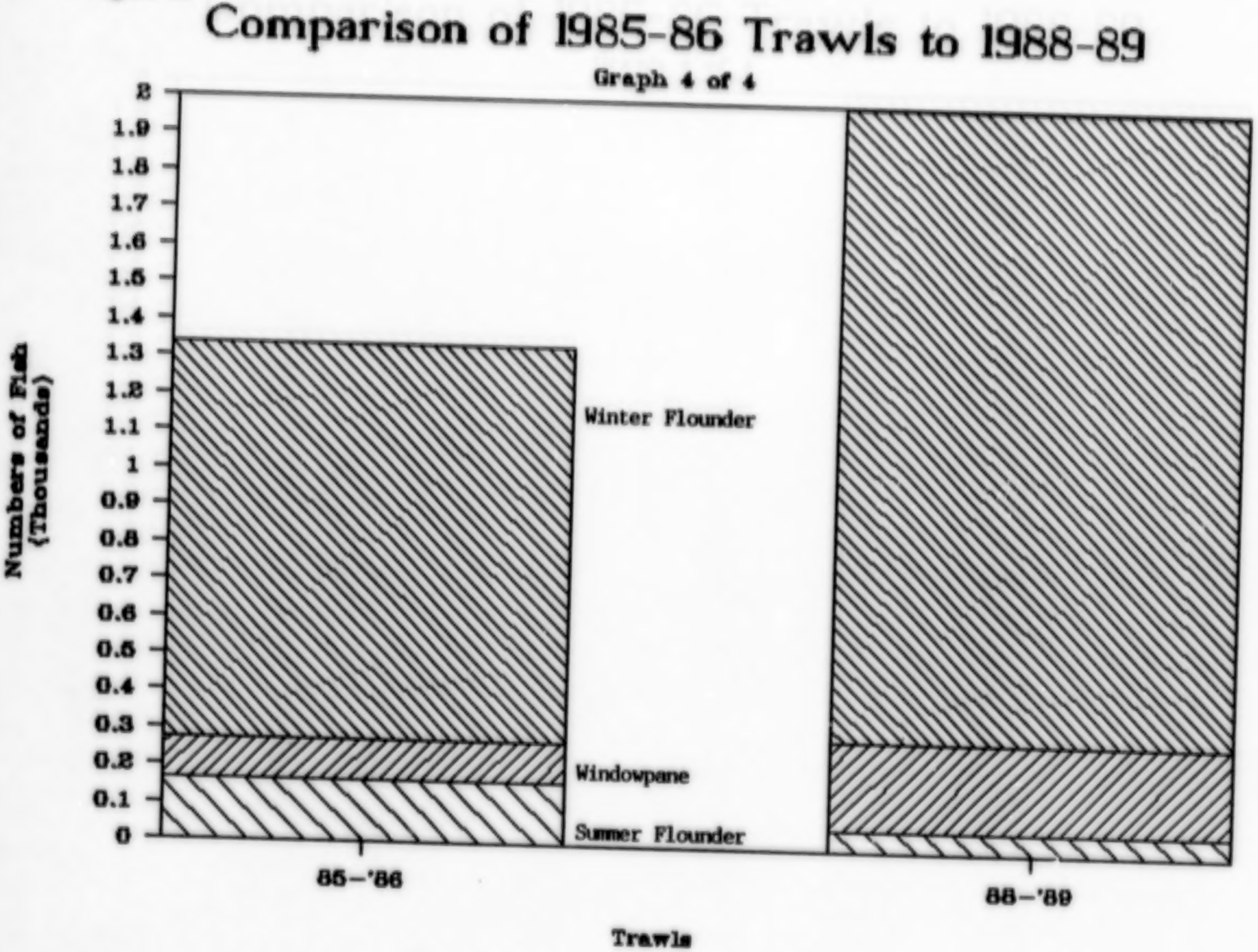


Figure 38


Comparison of 1985-86 Trawls to 1988-89
Graph 4 of 4
Numbers of Fish (Thousands)
2
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Winter Flounder
Windowpane
Summer Flounder
85-'86
88-'89
Trawls

APPENDICES

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Appendix A

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
November 1985 to October 1986

	November 1985				Dec. '85-Feb. '86				March 1986				April 1986				May 1986			
	Min	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**
Species																				
Smooth Dogfish	352	352	352	1																
Little Skate													454	454	454	1	347	347	347	1
American Eel	581	581	581	1	470	470	470	1												
Blueback Herring	89	91	90	3					351	360	356	2								
Alewife									95	165	130	2								
Atlantic Menhaden																	345	345	345	1
Bay Anchovy																	50	95	67	26
Oyster Toadfish																	95	209	154	10
Atlantic Cod																	38	53	46	6
Silver Hake																				
Red Hake	56	143	99	4													48	64	57	4
Spotted Hake	42	84	54	12									33	130	85	10	46	205	107	133
White Hake																				
Mummichog									51	51	51	1	40	40	40	1				
Atlantic Silverside					103	103	103	1	111	111	111	1								
Fourspine Stickleback					37	50	45	9	37	45	40	3								
Bluespotted Cornetfish																				
Lined Seahorse													69	97	78	10	150	150	150	1
Northern Pipefish	186	186	186	1					155	215	188	3	127	241	182	31	182	182	182	1
Striped Bass	209	209	209	1	180	180	180	1												
Black Sea Bass													67	109	88	2				
Yellow Jack																				
Lookdown																				
Scup																	105	105	105	1
Weakfish																				
Spotfin Butterflyfish																				
Tautog	130	130	130	1																
Cunner									86	86	86	1	81	135	110	3				
American Sandlance	127	149	140	3					132	150	138	5								
Rock Gunnel	125	135	130	2	98	120	106	3	101	122	114	8	95	128	113	6	136	136	136	1
Butterfish																	53	53	53	1
Striped Searobin																	86	150	118	2
Grubby	88	88	88	1	77	189	106	13	80	132	98	11					30	177	79	3
Smallmouth Flounder	50	104	90	13									75	133	104	2	84	84	84	1
Summer Flounder																	247	405	292	9
Four-spot Flounder	105	176	149	12																
Windowpane	81	324	241	33					288	319	304	3	257	315	290	21	68	317	264	25
Winter Flounder	94	397	207	211	80	336	166	120	80	430	187	239	84	410	224	125	115	350	187	42
Planehead Filefish																				
Northern Puffer																				
Total Fish/Month				211				148				279				213				149

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Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) for Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
November 1985 to October 1986

	November 1985				Dec. '85-Feb. '86				March 1986				April 1986				May 1986			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Smooth Dogfish	352	352	352	1																
Little Skate													454	454	454	1	347	347	347	1
American Eel	581	581	581	1	470	470	470	1												
Blueback Herring	89	91	90	3					351	360	356	2								
Alewife									95	165	130	2								
Atlantic Menhaden																	345	345	345	1
Bay Anchovy																	50	95	67	26
Oyster Toadfish																	95	209	154	10
Atlantic Cod																	38	53	46	6
Silver Hake																				
Red Hake	56	143	99	4													48	64	57	4
Spotted Hake	42	84	54	12									33	130	85	10	46	205	107	133
White Hake																				
Mummichog									51	51	51	1	40	40	40	1				
Atlantic Silverside					103	103	103	1	111	111	111	1								
Fourspine Stickleback					37	50	45	9	37	45	40	3								
Bluespotted Cornetfish																				
Lined Seahorse													69	97	78	10	150	150	150	1
Northern Pipefish	186	186	186	1					155	215	188	3	127	241	182	31	182	182	182	1
Striped Bass	209	209	209	1	180	180	180	1												
Black Sea Bass													67	109	88	2				
Yellow Jack																				
Lookdown																				
Scup																	105	105	105	1
Weakfish																				
Spotfin Butterflyfish																				
Tautog	130	130	130	1																
Cunner									86	86	86	1	81	135	110	3				
American Sandlance	127	149	140	3					132	150	138	5								
Rock Gunnel	125	135	130	2	98	120	106	3	101	122	114	8	95	128	113	6	136	136	136	1
Butterfish																	53	53	53	1
Striped Searobin																	86	150	118	2
Grubby	88	88	88	1	77	189	106	13	80	132	98	11					30	177	79	3
Smallmouth Flounder	50	104	90	13									75	133	104	2	84	84	84	1
Summer Flounder																	247	405	292	9
Four-spot Flounder	105	176	149	12																
Windowpane	81	324	241	33					288	319	304	3	257	315	290	21	68	317	264	25
Winter Flounder	94	397	207	211	80	336	166	120	80	430	187	239	84	410	224	125	115	350	187	42
Planehead Filefish																				
Northern Puffer																				
Total Fish/Month				299				148				279				213				149

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
November 1985 to October 1986

	June 1986				August 1986				Early September 1986				Late September 1986				October 1986			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Smooth Dogfish																				
Little Skate																				
American Eel					176	176	176	1					267	267	267	1				
Blueback Herring	71	79	75	2																
Alewife																				
Atlantic Menhaden																				
Bay Anchovy	66	75	71	2	68	74	71	2	35	84	50	79	45	65	54	25				
Oyster Toadfish	256	256	256	1	142	229	178	3	108	177	131	3	55	55	55	1	109	109	109	1
Atlantic Cod	41	82	58	40																
Silver Hake	55	55	55	1													73	88	81	4
Red Hake	56	78	69	3																
Spotted Hake	71	212	124	29																
White Hake	62	67	75	2																
Mummichog																				
Atlantic Silverside					79	119	87	2	67	97	87	7								
Fourspine Stickleback																				
Bluespotted Coronetfish																	409	409	409	1
Lined Seahorse	76	152	112	4	112	129	119	6	95	140	119	9	130	155	141	3	93	145	119	9
Northern Pipefish	210	210	210	1	138	195	166	7	160	184	172	2	163	163	163	1	168	168	168	1
Striped Bass																				
Black Sea Bass	72	72	72	1	148	203	185	4	51	176	111	4	48	223	105	14	50	96	73	13
Yellow Jack									37	37	37	1								
Lookdown													62	62	62	1				
Scup	95	127	113	13	28	170	75	7	48	202	125	173	54	198	80	34				
Weakfish					30	61	45	95	54	125	86	20								
Spotfin Butterflyfish													35	50	43	3				
Tautog	164	473	320	5	63	275	206	7	153	380	275	16					72	72	72	1
Cunner					18	40	30	5	39	87	53	7					45	45	45	1
American Sandlance																				
Rock Gunnel	135	135	135	1																
Butterfish	54	74	66	10																
Striped Searobin	100	161	128	6	26	188	51	43	66	105	88	8	100	100	100	1				
Grubby	104	104	104	1																
Smallmouth Flounder													64	64	64	1	64	79	72	5
Summer Flounder	251	531	327	13	151	630	295	32	190	580	224	20	189	600	279	12	171	295	233	7
Four-spot Flounder					54	59	57	2					124	124	124	1				
Windowpane	95	333	262	11	111	330	225	8	118	322	203	3	107	182	138	3				
Winter Flounder	40	306	170	110	72	343	192	81	84	268	205	50	97	291	210	48	83	372	228	35
Planehead Filefish									102	102	102	1								
Northern Puffer					33	37	35	2	48	48	48	1								
Total Fish/Month				297				307				403				148				228

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey November 1985 to October 1986

Species	Total Single Species all Trawls
Smooth Dogfish	1
Little Skate	2
American Eel	4
Blueback Herring	7
Alewife	2
Atlantic Menhaden	1
Bay Anchovy	134
Oyster Toadfish	19
Atlantic Cod	46
Silver Hake	5
Red Hake	11
Spotted Hake	64
White Hake	2
Mummichog	2
Atlantic Silverside	11
Fourspine Stickleback	12
Bluespotted Coronetfish	1
Lined Seahorse	42
Northern Pipefish	49
Striped Bass	2
Black Sea Bass	38
Yellow Jack	1
Lookdown	1
Scup	228
Weakfish	115
Spotfin Butterflyfish	3
Tautog	30
Cunner	17
American Sandlance	8
Rock Gunnel	21
Butterfish	11
Striped Searobin	70
Grubby	122
Smallmouth Flounder	17
Summer Flounder	168
Four-spot Flounder	15
Windowpane	107
Winter Flounder	1061
Planehead Filefish	1
Northern Puffer	1
Total	2452

Appendix B

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 1

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Spotted Hake	178	200	191	4																
Tautog	230	230	230	1																
Winter Flounder	275	326	294	4	138	154	146	2	126	303	225	4	No	Fish			96	290	174	11
Cunner	77	183	122	3																
Porgy	100	122	112	7																
Seahorse	74	74	74	1																
Black Sea Bass									165	165	165	1								
Red Hake																	82	82	82	1
Pipefish																	200	200	200	1
Northern Searobin																	112	112	112	1
Spotfin Butterflyfish																	16	16	16	1
Bigeye																	111	111	111	1
Windowpane Flounder																				
Grubby																				
Smallmouth Flounder																				
Rock Gunnel																				
Clearnose Skate																				
Butterfish																				
Red Porgy																				
# Fish/Trawl				20				2				5				0				16
# Species/Trawl				6				1				2				0				6

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 1

	November 1988				May 1989				June 1989				July 1989				August 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Spotted Hake																				
Tautog																				
Winter Flounder	112	402	257	16	No	Fish			153	153	153	1	132	241	190	11	95	381	241	10
Cunner																				
Porgy																				
Seahorse																				
Black Sea Bass																				
Red Hake	88	156	125	8																
Pipefish																	259	259	259	1
Northern Searobin																	192	210	201	2
Spotfin Butterflyfish																				
Bigeye																				
Windowpane	77	320	166	8													259	259	259	1
Grubby	76	135	113	7																
Smallmouth Flounder	62	73	67	7																
Rock Gunnel	155	155	155	1																
Clearnose Skate									642	642	642	1								
Butterfish									51	51	51	1								
Red Porgy													130	130	130	1				
# Fish/Trawl				47				0				3				11				14
# Species/Trawl				6				0				3				2				4

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 1

	September 1989				Total Single Species all Trawls	Average Species Catch/Trawl
Species	Min	Max	Mean	Q		
Spotted Hake					4	.4
Tautog					1	.1
Winter Flounder					59	5.9
Cunner					3	.3
Porgy					7	.7
Seahorse					1	.1
Black Sea Bass					1	.1
Red Hake					9	.9
Pipefish					1	.1
Northern Searobin					3	.3
Spotfin Butterflyfish	52	52	52	1	2	.2
Bigeye					1	.1
Windowpane					9	.9
Grubby					7	.7
Smallmouth Flounder					7	.7
Rock Gunnel					1	.1
Clearnose Skate					1	.1
Butterfish					1	.1
Red Porgy					2	.2
# Fish/Trawl				1		
# Species/Trawl				1		
Total					120	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 2

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	147	188	173	3	76	278	157	3												
Windowpane	112	217	146	7																
Smallmouth Flounder	111	111	111	1																
Tautog									234	234	234	1	70	70	70	1				
Pipefish													190	190	190	1				
Atlantic Silverside																	35	35	35	1
Red Porgy																				
Red Hake																				
Northern Searobin																				
Seahorse																				
# Fish/Trawl				11				3				1				2				1
# Species/Trawl				3				1				1				2				1

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) for Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 2

	June 1989				July 1989				August 1989				September 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																
Winter Flounder	34	41	38	2	170	170	170	1	No	Fish			No	Fish		
Windowpane					130	247	189	5								
Smallmouth Flounder	105	105	105	1												
Tautog					136	555	305	5								
Pipefish																
Atlantic Silverside																
Red Porgy	118	118	118	1	121	138	128	3								
Red Hake	68	68	68	1												
Northern Searobin	41	41	41	1												
Seahorse					105	105	105	1								
# Fish/Trawl				6				15				0				0
# Species/ Trawl				5				5				0				0

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey

June 1988 to October 1989

Trawl Site # 2

Species	Total Single Species all Trawls	Average Species Catch/Trawl
Winter Flounder	9	1
Windowpane	12	1.33
Smallmouth Flounder	2	.22
Tautog	7	.7
Pipefish	1	.1
Atlantic Silverside	1	.1
Red Porgy	4	.4
Red Hake	1	.1
Northern Searobin	1	.1
Seahorse	1	.1
Total	39	

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Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 3

	June 1988				July 1988				August 1988				October 1988				May 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Windowpane	126	267	160	7	75	185	130	33	87	180	122	7	79	237	155	9	No	Fish		
Smallmouth Flounder	92	92	92	1	110	122	115	3					40	62	53	3				
Spotted Hake	185	185	185	1																
Tautog	167	167	167	1																
Porgy	98	128	113	16	126	136	130	5												
Winter Flounder	123	239	181	45					123	328	226	2	62	318	186	13				
Summer Flounder									364	364	364	1								
Planehead Filefish									107	107	107	1								
Northern Stargazer									120	120	120	1								
Northern Searobin									145	145	145	1								
Black Sea Bass													70	70	70	1				
Red Porgy																				
Orange Filefish																				
Striped Searobin																				
# Fish/Trawl				72				41				13				26				0
# Species/Trawl				6				3				6				4				0

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 3

	June 1989				July 1989				August 1989				September 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																
Windowpane	98	195	147	2	53	235	145	20	242	242	242	1				
Smallmouth Flounder																
Spotted Hake																
Tautog									234	260	242	4				
Porgy																
Winter Flounder	133	230	182	13					169	222	196	7	154	261	196	12
Summer Flounder	550	550	550	1	462	462	462	1								
Planehead Filefish													206	206	206	1
Northern Stargazer																
Northern Searobin									200	200	200	1				
Black Sea Bass																
Red Porgy					125	125	125	1								
Orange Filefish									83	88	86	2				
Striped Searobin													104	104	104	1
# Fish/Trawl				16				22				15				14
# Species/Trawl				3				3				5				3

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 3

Species	Total Single Species all Trawls	Average Species Catch/Trawl
Windowpane	79	8.7
Smallmouth Flounder	7	.7
Spotted Hake	2	.2
Tautog	5	.5
Porgy	21	2.3
Winter Flounder	92	10.2
Summer Flounder	3	.3
Planehead Filefish	2	.2
Northern Stargazer	1	.1
Northern Searobin	2	.2
Black Sea Bass	1	.1
Red Porgy	1	.1
Orange Filefish	2	.2
Striped Searobin	1	.1
Total	219	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 4

	June 1988				July 1988				August 1988				September 1988				October 1988			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Atlantic Herring																				
Spotted Hake																				
Inshore Lizardfish																				
Winter Flounder	134	267	201	27	51	327	189	30					116	202	174	6	182	308	271	4
Windowpane	117	346	232	16	95	95	95	1					50	135	100	8	278	287	283	2
Smallmouth Flounder	84	84	84	1					33	47	40	11	57	164	98	8	52	68	61	4
Clearnose Skate	588	588	588	1	595	595	595	1												
Summer Flounder					322	347	335	2					390	390	390	1				
Spiny Dogfish					405	405	405	1												
Porgy					11	140	125	4												
Orange Filefish									201	201	201	1								
Northern Puffer									32	59	46	4								
Striped Searobin									26	76	51	19								
Seahorse									110	110	110	1					100	100	100	1
American Eel									222	222	222	1								
Northern Kingfish									66	66	66	1	90	115	103	2				
Black Sea Bass									50	65	58	9	90	90	90	1				
Spotfin Butterflyfish									43	45	44	3								
Butterfish													100	100	100	1				
Four-Spot Flounder													187	187	187	1				
Northern Stargazer													212	212	212	1				
Pipefish													162	162	162	1				
Goby sp.													70	70	70	1				
Smooth Dogfish													520	520	520	1				
Northern Searobin													76	255	166	74				
Scup																	90	90	90	1
# Fish/Trawl				45				39				50				106				12
# Species/Trawl				4				6				9				13				5

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 4

	December 1988				January 1989				February 1989				June 1989				July 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Atlantic Herring	263	263	263	1																
Spotted Hake									32	47	40	2								
Inshore Lizardfish																				
Winter Flounder					287	287	287	1					No	Fish			156	244	179	8
Windowpane					127	127	127	1												
Smallmouth Flounder																				
Clearnose Skate	263	263	263	1																
Summer Flounder																				
Spiny Dogfish																				
Porgy																				
Orange Filefish																				
Northern Puffer																				
Striped Searobin																				
Seahorse																	107	107	107	1
American Eel																	98	98	98	1
Northern Kingfish																				
Black Sea Bass																				
Spotfin Butterflyfish																				
Butterfish																				
Four-Spot Flounder																				
Northern Stargazer																				
Pipefish									136	136	136	1								
Goby sp.																				
Smooth Dogfish																				
Northern Serobin																	61	61	61	1
Scup																				
# Fish/Trawl				2				2				3				0				11
# Species/Trawl				1				2				2				0				3

85

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 4

	August 1989				September 1989				Total Single Species all Trawls	Average Species Catch/Trawl
Species	Min	Max	Mean	Q	Min	Max	Mean	Q		
Atlantic Herring									1	.08
Spotted Hake									2	.16
Inshore Lizardfish									1	.08
Winter Flounder	79	197	138	2					78	6.5
Windowpane									28	2.3
Smallmouth Flounder									24	2.0
Clearnose Skate									2	.16
Summer Flounder	60	226	143	3	265	265	265	1	7	.58
Spiny Dogfish									1	.08
Porgy									4	.33
Orange Filefish									1	.08
Northern Puffer									4	.33
Striped Searobin									19	1.5
Seahorse									3	.25
American Eel	212	212	212	1					3	.25
Northern Kingfish									3	.25
Black Sea Bass									10	.83
Spotfin Butterflyfish									3	.25
Butterfish									1	.08
Northern Stargazer									1	.08
Pipefish									2	.16
Goby sp.									1	.08
Smooth Dogfish									1	.08
Northern Searobin									75	6.2
Scup									1	.08
# Fish/Trawl				6				1		
# Species/Trawl				3				1		
Total								277		

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 5

	June 1988				July 1988				August 1988				September 1988				October 1988			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Bluespotted Coronetfish																				
Red Hake																				
Striped Searobin																				
Seahorse																				
Tautog	316	353	335	2	95	292	205	5	No	Fish			No	Fish						
Winter Flounder					85	29	188	63									102	265	184	13
Windowpane					65	279	172	34												
Smallmouth Flounder					49	113	94	5									61	79	68	9
Spiny Dogfish					378	410	396	3												
Spotted Hake					168	234	210	3												
Clearnose Skate					621	671	646	2												
Northern Searobin					123	123	123	1												
Cunner					249	249	249	1												
Summer Flounder					420	670	544	3												
Weakfish																	69	69	69	1
Four-Spot Flounder																	117	117	117	1
Northern Stargazer																	147	147	147	1
Atlantic Silversides																				
Blueback Herring																				
Grubby																				
White Perch																				
Oyster Toadfish																				
Tomcod																				
Alewife																				
Red Porgy																				
# Fish/Trawl				2				120				0				0				25
# Species/Trawl				1				10				0				0				5

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 5

	January 1989				February 1989				March 1989				May 1989				July 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Bluespotted Coronetfish																				
Red Hake																				
Striped Searobin																				
Seahorse																				
Tautog																				
Winter Flounder	111	265	188	110	76	301	189	243	95	256	176	668	126	331	186	6	66	280	173	28
Windowpane	134	134	134	1	104	132	115	3	155	313	234	2					79	163	108	3
Smallmouth Flounder																				
Spiny Dogfish																				
Spotted Hake									160	160	160	1								
Clearnose Skate																				
Northern Searobin																				
Cunner									235	235	235	1								
Summer Flounder																				
Weakfish																				
Four-Spot Flounder																				
Northern Stargazer																				
Atlantic Silverside	122	122	122	1																
Blueback Herring	153	169	161	2	126	292	236	7	133	293	241	12								
Grubby					76	152	114	36	76	115	93	6								
White Perch					113	129	121	2												
Oyster Toadfish					141	141	141	1												
Tomcod																	95	112	107	5
Alewife																	97	97	97	1
Red Porgy																	128	128	128	1
# Fish/Trawl				114				292				690				6				38
# Species/Trawl				4				6				6				1				5

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 5

	August 1989				September 1989				Total Single Species all Trawls	Average Species Catch/Trawl
	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species										
Bluespotted Coronetfish					293	430	348	3	1	.25
Red Hake					260	260	260	260	1	.08
Striped Searobin					31	63	42	5	1	.41
Seahorse					90	97	94	2	2	.16
Tautog					90	155	132	3	10	.83
Winter Flounder	160	256	208	9	66	246	156	12	1152	96
Windowpane	82	191	124	3	306	306	306	1	47	3.9
Smallmouth Flounder					39	39	39	1	15	1.2
Spiny Dogfish									3	.25
Spotted Hake					260	260	260	1	4	.33
Clearnose Skate									2	.16
Northern Searobin					293	430	348	3	1	.08
Cunner									2	.16
Summer Flounder	199	203	201	2					5	.41
Weakfish					61	109	85	2	3	.25
Four-Spot Flounder									1	.08
Northern Stargazer									1	.08
Atlantic Silverside									1	.08
Blueback Herring									21	1.75
Grubby									42	3.5
White Perch									2	.16
Oyster Toadfish									1	.08
Tomcod									5	.41
Alewife									1	.08
Red Porgy									1	.08
# Fish/Trawl				14				30		
# Species/Trawl ,				3				9		
Total									1331	

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 6

	June 1988				July 1988				August 1988				September 1988				October 1988			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Bluespotted Coronetfish																				
White Perch																				
Cunner																				
Winter Flounder	62	175	143	5	75	229	152	29	96	292	194	8	103	369	236	114	325	325	325	1
Porgy	120	120	120	1																
Spiny Dogfish					424	450	437	2												
Windowpane					36	175	101	4	108	175	137	4	270	106	188	8	261	295	285	4
Summer Flounder					336	336	336	1	362	362	362	1								
Northern Stargazer									74	74	74	1								
Northern Kingfish									52	96	74	2	151	151	151	1				
Striped Searobin									30	225	127	7	99	128	116	5				
Weakfish									42	86	64	56	69	98	84	20				
Smallmouth Flounder									36	119	80	3	56	134	78	5	43	66	55	11
Four-Spot Flounder									59	64	62	4								
Atlantic Silverside													53	53	53	1				
American Eel													232	232	232	1				
Inshore Lizardfish													150	150	150	1				
Jolthead Porgy													170	170	170	1				
Spotfin Butterflyfish													50	50	50	1				
Tautog													65	115	92	3				
Oyster Toadfish													250	250	250	1				
Orange Filefish													230	230	230	1				
Red Hake																	43	85	69	6
Grubby																				
Rock Gunnel																				
Whiting																				
Striped Bass																				
# Fish/Trawl				6				36				86				163				22
# Species/Trawl				2				4				9				14				4

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 6

	November 1988				December 1988				February 1989				June 1989				August 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Bluespotted Coronetfish																	292	292	292	1
White Perch									111	131	121	2								
Cunner																				
Winter Flounder	126	225	176	20	225	225	225	1	95	86	255	171	129	230	189	8	86	255	171	7
Porgy																				
Spiny Dogfish																				
Windowpane	76	257	119	8					96	96	96	1					110	110	110	1
Summer Flounder																	202	202	202	1
Striped Searobin																				
Weakfish																				
Smallmouth Flounder	66	137	90	3					89	115	102	2								
Four-Spot Flounder																				
Atlantic Silverside																				
American Eel																				
Inshore Lizardfish																				
Red Porgy																				
Spotfin Butterflyfish																				
Tautog																				
Oyster Toadfish																				
Orange Filefish																				
Red Hake	72	118	95	29																
Grubby	71	171	92	6	125	136	131	2	81	131	106	26								
Rock Gunnel	145	145	145	1																
Whiting					114	114	114	1												
Striped Bass									179	179	179	1								
# Fish/Trawl				67				4				203				8				10
# Species/Trawl				6				3				6				1				4

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 6

	September 1989				October 1989				Total Single Species all Trawls	Average Species Catch/Trawl
Species	Min	Max	Mean	Q	Min	Max	Mean	Q		
Bluespotted Cornetfish									1	.08
White Perch									2	.16
Cunner	155	155	155	1					1	.08
Winter Flounder	82	381	232	10	108	230	169	7	502	56.9
Porgy									1	.08
Spiny Dogfish									2	.16
Windowpane	252	265	259	2					32	2.6
Summer Flounder	270	270	270	1					4	.33
Northern Stargazer									1	.08
Northern Kingfish									3	.33
Striped Searobin					80	80	80	1	13	1.08
Weakfish									76	6.3
Smallmouth Flounder									24	2.0
Four-Spot Flounder									4	.33
Atlantic Silverside									1	.08
American Eel									1	.08
Inshore Lizardfish									1	.08
Red Porgy									1	.08
Spotfin Butterflyfish									2	.16
Tautog	430	445	438	2	248	350	299	2	7	.58
Oyster Toadfish	197	241	219	2					3	.25
Orange Filefish									1	.08
Red Hake									35	2.91
Grubby									34	2.83
Rock Gunnel									1	.08
Whiting									1	.08
Striped Bass									1	.08
# Fish/Trawl				18				10		
# Species/Trawl				6				3		
Total									755	

Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 7

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Porgy	94	125	110	110																
Winter Flounder	75	257	166	65	195	195	195	1					83	275	179	23	143	341	242	4
Northern Searobin	88	88	88	1													88	88	88	1
Oyster Toadfish	210	240	230	2	150	150	150	1												
Summer Flounder	330	330	330	1	341	341	341	1												
Pipefish	230	265	248	2																
Planehead Filefish									86	86	86	1								
Tautog									144	410	277	11	64	319	192	2				
Cunner									203	203	203	1								
Bluespotted Coronetfish									245	245	245	1								
Black Sea Bass													84	84	84	1				
Windowpane																				
Smallmouth Flounder																				
Spotted Hake																				
Grubby																				
Red Porgy																				
Naked Goby																				
Red Hake																				
Hogchoker																				
Weakfish																				
Scup																				
# Fish/Trawl				181				3				14				26				5
# Species/Trawl				6				3				4				3				2

Trawl Site # 7

	November 1988				December 1988				June 1989				July 1989				August 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Porgy																				
Winter Flounder	122	244	183	9	210	231	221	3	78	232	155	11	126	242	184	26	78	316	197	90
Northern Searobin													135	180	159	3	188	188	188	1
Oyster Toadfish													122	143	133	3	135	310	123	16
Summer Flounder													54	160	107	12	188	231	210	4
Pipefish																				
Planehead Filefish																				
Tautog	80	80	80	1					169	300	235	2	220	220	220	1	178	178	178	1
Cunner	77	77	77	1									111	192	152	2				
Bluespotted Coronetfish																				
Black Sea Bass																				
Windowpane	135	171	147	3	110	291	201	5	260	270	265	2	79	79	79	1				
Smallmouth Flounder	68	86	77	3																
Spotted Hake	65	97	80	3																
Grubby					118	144	131	5									108	108	108	1
Red Porgy									129	171	142	4	117	140	129	45	158	182	170	8
Naked Goby									47	63	55	2								
Red Hake									92	92	92	1								
Hogchoaker																	117	117	117	1
Weakfish																	145	145	145	1
Scup																				
# Fish/Trawl				20				13				22				93				123
# Species/Trawl				6				3				6				8				9

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 7

	September 1989				October 1989				Total Single Species all Trawls	Average Species Catch/Trawl
	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species										
Porgy									110	9.16
Winter Flounder	160	252	206	26	105	245	175	81	339	28.2
Northern Searobin					58	58	58	1	7	.58
Oyster Toadfish					170	282	226	2	24	2.0
Summer Flounder									18	1.5
Pipefish									2	.16
Planehead Filefish	120	124	122	2	138	138	138	1	5	.41
Tautog									18	1.5
Cunner									4	.33
Bluespotted Coronetfish									1	.08
Black Sea Bass									1	.08
Windowpane									11	.91
Smallmouth Flounder									3	.25
Spotted Hake									3	.25
Grubby									6	.50
Red Porgy									57	4.75
Naked Goby									2	.16
Red Hake									1	.08
Hogchoaker									1	.08
Scup					135	135	135	1	1	.08
# Fish/Trawl				28				86		
# Species/Trawl				2				4		
Total									615	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 8

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	60	205	133	85	162	162	162	1	66	246	156	27	88	291	159	5	126	220	173	31
Windowpane	150	150	150	1																
Pipefish	218	220	219	2																
Porgy	110	220	165	17					138	138	138	1								
Spotted Hake	166	220	193	8																
Oyster Toadfish	64	236	144	4																
Striped Searobin	110	110	110	1					40	77	59	2								
Smallmouth Flounder									42	42	42	1								
Weakfish									47	100	74	26								
Red Hake																				
Red Porgy																				
Summer Flounder																				
Northern Searobin																				
Orange Filefish																				
Northern Puffer																				
Inshore Lizardfish																				
# Fish/Trawl				118				1				57				5				31
# Species/Trawl				7				1				5				1				1

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 8

	June 1989				July 1989				August 1989				September 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Winter Flounder	62	240	151	15	58	230	144	8	85	244	165	33	251	251	251	1
Windowpane									72	91	82	3				
Pipefish	175	175	175	1					167	174	168	2				
Porgy																
Spotted Hake	135	255	185	3												
Oyster Toadfish	119	119	119	1	115	180	153	3	102	185	144	10				
Striped Searobin																
Smallmouth Flounder																
Weakfish									60	102	81	6				
Red Hake	92	92	92	1												
Red Porgy					128	139	134	6	116	176	146	2				
Summer Flounder					166	166	166	1	215	239	227	4				
Northern Searobin					160	171	166	2	106	106	106	1	55	55	55	1
Orange Filefish									78	80	79	2				
Northern Puffer													21	21	21	1
Inshore Lizardfish													141	141	141	1
# Fish/Trawl				21				20				61				4
# Species/Trawl				5				5				8				4

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 8

	October 1989				Total Single Species all Trawls	Average Species Catch/Trawl
	Min	Max	Mean	Q		
Species						
Winter Flounder	84	248	166	152	358	35.8
Windowpane					4	.4
Pipefish					5	.5
Porgy					18	1.8
Spotted Hake					11	1.1
Oyster Toadfish					18	1.8
Striped Searobin					3	.3
Smallmouth Flounder					1	.1
Weakfish					32	3.2
Red Hake					1	.1
Red Porgy					8	.8
Summer Flounder					5	.5
Northern Searobin					4	.4
Orange Filefish					2	.2
Northern Puffer					1	.1
Inshore Lizardfish					1	.1
# Fish/Trawl				152		
# Species/Trawl				1		
Total					472	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 9

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	No	Fish			75	225	150	37					100	265	183	3	120	131	126	2
Pipefish					90	90	90	1												
Summer Flounder					317	317	317	1												
Seahorse					115	130	123	4												
Porgy									148	162	155	4								
Weakfish									82	82	82	1								
Boston Blackie									80	137	109	2								
Cunner									70	97	84	2								
Tautog									52	72	62	3								
Oyster Toadfish									120	131	126	2								
Butterfish													34	92	63	2				
Smallmouth Flounder													67	67	67	1				
Red Porgy																				
Orange Filefish																				
# Fish/Trawl				0				43				14				6				2
# Species/Trawl				0				4				6				3				1

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 9

	June 1989				July 1989				August 1989				Total Single Species all Trawls	Average Species Catch/Trawl
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Winter Flounder	No	Fish			No	Fish			87	220	154	4	46	5.75
Pipefish													1	.13
Summer Flounder													1	.13
Seahorse													4	.50
Porgy													4	.50
Weakfish													1	.13
Boston Blackie													2	.25
Cunner													2	.25
Tautog													3	.38
Oyster Toadfish													2	.25
Butterfish													2	.25
Smallmouth Flounder													1	.13
Red Porgy									156	156	156	1	1	.13
Orange Filefish									80	80	80	1	1	.13
# Fish/Trawl				0				0				6		
# Species/Trawl				0				0				3		
Total													71	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 10

	June 1988				July 1988				August 1988				September 1988				October 1988			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Oyster Toadfish	54	54	54	1	No	Fish			No	Fish							No	Fish		
Northern Kingfish													110	145	128	4				
# Fish/Trawl				1				0				0				4				0
# Species/Trawl				1				0				0				1				0

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 10

	October 1989				June 1989				August 1989				Total Single Species all Trawls	Average Species Catch/Trawl
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species														
Oyster Toadfish	No	Fish			No	Fish			No	Fish			1	.14
Northern Kingfish													4	.57
# Fish/Trawl				0				0				0		
# Species/Trawl				0				0				0		
Total													5	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 11

	June 1988				July 1988				August 1988				September 1988				January 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	No	Fish			55	202	127	8					124	260	192	10	164	164	164	1
Seahorse					140	140	140	1												
Fourspine Stickleback									40	40	40	1								
Spot													130	187	159	128				
Weakfish													99	149	124	6				
Oyster Toadfish													132	166	149	2				
Striped Searobin													82	82	82	1				
Tautog													82	82	82	1				
Inshore Lizardfish																				
Northern Puffer																				
Pipefish																				
# Fish/Trawl				0				9				1				148				1
# Species/Trawl				0				2				1				6				1

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 11

	July 1989				August 1989				September 1989				Total Single Species all Trawls	Average Species Catch/Trawl
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species														
Winter Flounder	No	Fish			141	152	147	4	238	238	238	1	24	3
Seahorse													1	.13
Fourspine Stickleback													1	.13
Spot													128	16
Weakfish													6	.75
Oyster Toadfish													2	.25
Striped Searobin													1	.13
Tautog													1	.13
Inshore Lizardfish									134	134	134	1	1	.13
Northern Puffer									70	70	70	1	1	.13
Pipefish									119	119	119	1	1	.13
# Fish/Trawl				0				4				4		
# Species/Trawl				0				1				4		
Total													167	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 12

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**
Species																				
Striped Searobin	367	367	367	1									61	92	77	8				
Porgy	115	115	115	1	134	144	139	3	140	140	140	1								
Summer Flounder	305	462	384	2																
Winter Flounder	75	182	129	8	69	121	95	22	88	88	88	1	97	122	110	4	322	322	322	1
Smallmouth Flounder	94	94	94	1									59	67	63	3	57	72	65	3
Pipefish	210	210	210	1									118	168	143	2				
Windowpane					75	86	81	3												
Bay Anchovy					77	88	83	4												
Atlantic Silverside					41	41	41	1	32	32	32	1	33	53	43	12				
Northern Kingfish									90	92	91	3								
Tautog													38	190	114	5				
Oyster Toadfish													125	125	125	1				
American Eel													205	205	205	1				
Seahorse													80	80	80	1				
Arrow Goby													29	33	31	2				
Red Porgy																				
Weakfish																				
Blackmouth Bass																				
# Fish/Trawl				14				33				6				39				4
# Species/Trawl				6				5				4				10				2

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Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 12

	November 1988				June 1989				July 1989				August 1989				September 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Striped Searobin					No	Fish							No	Fish			58	70	64	2
Porgy																				
Summer Flounder									132	186	159	4					200	257	229	5
Winter Flounder	117	345	231	10					64	186	175	4					75	105	90	3
Smallmouth Flounder	52	52	52	1																
Pipefish																	163	163	163	1
Windowpane																				
Bay Anchovy																				
Atlantic Silverside																	31	55	43	31
Northern Kingfish																				
Tautog																				
Oyster Toadfish																				
American Eel																				
Seahorse																				
Arrow Goby																				
Red Porgy									118	128	123	13					164	170	167	5
Weakfish																	95	109	102	2
Blackmouth Bass																	45	45	45	1
# Fish/Trawl				11				0				21				0				50
# Species/Trawl				2				0				3				0				8

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Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site #12

Species	Total Single Species all Trawls	Average Species Catch/Trawl
Striped Searobin	11	1.1
Porgy	5	.5
Summer Flounder	11	1.1
Winter Flounder	53	5.3
Smallmouth Flounder	8	.8
Pipefish	4	.4
Windowpane	3	.3
Bay Anchovy	4	.4
Atlantic Silverside	45	4.5
Northern Kingfish	3	.3
Tautog	5	.5
Oyster Toadfish	1	.1
American Eel	1	.1
Seahorse	1	.1
Arrow Goby	2	.2
Red Porgy	18	1.8
Weakfish	2	.2
Blackmouth Bass	1	.1
Total	178	

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) for Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 13

	June 1988				July 1988				August 1988				September 1988				October 1988			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	64	210	137	10	84	238	161	11					90	250	170	17	132	310	221	7
Summer Flounder	80	80	80	1																
Porgy	111	111	111	1	128	132	130	4												
Windowpane	43	156	100	4													147	154	151	2
Pipefish					135	200	168	2					155	155	155	1				
Weakfish									46	99	73	8	98	107	103	3				
Atlantic Silverside									39	39	39	1								
Oyster Toadfish									152	152	152	1	109	109	109	1				
Red Porgy													158	160	159	2				
Black Sea Bass													72	236	154	2	41	44	43	2
Striped Searobin													72	115	94	23				
Smallmouth Flounder													55	55	55	1	50	122	86	9
Tautog													325	325	325	1	42	42	42	1
American Eel													235	235	235	1				
Seahorse																				
Northern Searobin																				
# Fish/Trawl				16				17				10				52				21
# Species/Trawl				4				3				3				10				5

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Otter Trawl in Jamaica Bay Fisheries Survey
June 1988 to October 1989

Trawl Site # 13

	June 1989				July 1989				August 1989				September 1989			
Species	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**	**Min**	**Max**	**Mean**	**Q**
Winter Flounder	148	242	195	2	58	76	67	2					54	215	135	17
Summer Flounder					157	157	157	1								
Porgy																
Windowpane																
Pipefish									161	161	161	1	179	184	182	3
Weakfish									178	178	178	1				
Atlantic Silverside																
Oyster Toadfish																
Red Porgy	107	107	107	1					142	157	150	5				
Black Sea Bass																
Striped Searobin																
Smallmouth Flounder																
Tautog	465	465	465	1												
American Eel																
Seahorse					100	100	100	1	133	133	133	1				
Northern Searobin									192	192	192	1				
# Fish/Trawl				4				4				9				20
# Species/Trawl				3				3				5				2

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site #13

Species	Total Single Species all Trawls	Average Species Catch/Trawl
Winter Flounder	66	8.2
Summer Flounder	2	.25
Porgy	5	.62
Windowpane	6	.75
Pipefish	7	.88
Weakfish	12	1.5
Atlantic Silverside	1	.12
Oyster Toadfish	2	.25
Red Porgy	8	1.0
Black Sea Bass	4	.50
Striped Searobin	23	2.9
Smallmouth Flounder	10	1.2
Tautog	3	.38
American Eel	1	.12
Seahorse	2	.25
Northern Searobin	1	.12
Total	153	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 14

	June 1988				July 1988				August 1988				September 1988				November 1988			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Winter Flounder	160	160	160	1	99	166	133	5	76	180	128	12	84	309	197	51	118	222	170	8
Pipefish	60	234	147	5	132	132	132	1	125	125	125	1								
Seahorse	118	118	118	1	110	130	120	8	60	125	93	6	109	122	116	2				
Porgy					118	148	133	32												
Northern Kingfish									67	105	86	10	196	196	196	1				
Northern Searobin									68	88	78	2								
Black Sea Bass									60	60	60	1	59	92	76	9				
Weakfish									59	80	70	3								
Summer Flounder									370	382	376	3								
Smallmouth Flounder									40	40	40	1	40	124	82	24	56	72	64	3
Oyster Toadfish									120	275	189	2	100	100	100	1				
Tautog									45	48	47	2								
Red Porgy													64	74	69	3				
Striped Searobin													54	104	79	14				
Inshore Lizardfish													177	177	177	1				
Atlantic Silverside																	70	92	81	4
Spotted Hake																				
Grey Snapper																				
Rock Gunnel																				
Northern Puffer																				
# Fish/Trawl				7				46				43				106				15
# Species/Trawl				3				4				11				9				3

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Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 14

	May 1989				June 1989				July 1989				August 1989				September 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	129	218	174	2	216	216	216	1	57	182	120	13					170	226	198	12
Pipefish	132	220	176	19	185	185	185	1	117	162	145	5								
Seahorse	71	125	98	4					90	116	103	13					80	124	102	2
Porgy																				
Northern Kingfish																	175	175	175	1
Northern Searobin																				
Black Sea Bass																				
Weakfish																				
Summer Flounder																				
Smallmouth Flounder																				
Oyster Toadfish																				
Tautog	70	172	121	3	264	266	265	2					171	171	171	1				
Red Porgy									55	58	57	2								
Striped Searobin																				
Inshore Lizardfish																				
Atlantic Silverside																				
Spotted Hake	59	59	59	1																
Grey Snapper	62	62	62	1																
Rock Gunnel	126	157	142	3																
Northern Puffer									24	32	28	3								
# Fish/Trawl				33				4				36				1				15
# Species/Trawl				7				3				5				1				3

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site #14

Species	Total Single Species all Trawls	Average Species Catch/Trawl
Winter Flounder	105	10.5
Pipefish	32	3.2
Seahorse	36	3.6
Porgy	32	3.2
Northern Kingfish	11	1.1
Northern Searobin	2	.2
Black Sea Bass	10	1
Weakfish	3	.3
Summer Flounder	3	.3
Smallmouth Flounder	28	2.8
Oyster Toadfish	3	.3
Tautog	8	.8
Red Porgy	5	.5
Striped Searobin	14	1.4
Inshore Lizardfish	1	.1
Atlantic Silverside	4	.4
Spotted Hake	1	.1
Grey Snapper	1	.1
Rock Gunnel	3	.3
Northern Puffer	3	.3
Total	306	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 15

	June 1988				July 1988				August 1988				September 1988				June 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Winter Flounder	128	254	191	4	103	205	154	9					152	152	152	1	No	Fish		
Porgy	105	121	113	4	103	135	119	5												
Summer Flounder	322	322	322	1	316	316	316	1												
Clearnose Skate	554	584	569	2																
Pipefish					205	205	205	1												
Striped Bass					585	585	585	1												
Smallmouth Flounder									120	120	120	1								
Northern Stargazer									57	57	57	1								
Striped Searobin									70	73	72	2								
Weakfish									48	64	56	4								
Windowpane									61	61	61	1	91	290	191	4				
Seahorse									61	61	61	1								
Red Porgy																				
Oyster Toadfish																				
# Fish/Trawl				11				17				10				5				0
# Species/Trawl				4				5				6				2				0

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Otter Trawl in Jamaica Bay Fisheries Survey June 1988 to October 1989

Trawl Site # 15

	July 1989				August 1989				September 1989				Total Single Species all Trawls	Average Species Catch/Trawl
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Winter Flounder	No	Fish			153	189	171	4					18	2.25
Porgy													9	1.12
Summer Flounder													3	.37
Clearnose Skate													2	.25
Pipefish													1	.13
Striped Bass													1	.13
Smallmouth Flounder													1	.13
Northern Stargazer													1	.13
Striped Searobin													2	.25
Weakfish													4	.50
Windowpane													5	.62
Seahorse													1	.13
Red Porgy									168	168	168	1	1	.13
Oyster Toadfish									264	264	264	1	1	.13
# Fish/Trawl				0				4				2		
# Species/Trawl				0				1				2		
Total													50	

Appendix C

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Gill Nets in Jamaica Bay Fisheries Survey November 1985 to October 1986

	November 1985				Dec. '85-Feb. '86				March 1986				April 1986				May 1986			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Smooth Dogfish																	615	1064	960	11
Cownose Ray																				
American Eel					530	530	530	1												
Blueback Herring									274	383	334	22	154	366	257	38				
Alewife													116	244	201	3				
Atlantic Menhaden	269	340	294	62									228	389	323	101	275	355	313	96
Lined Seahorse													72	72	72	1				
Northern Pipefish																				
Black Sea Bass																				
Bluefish									425	486	460	5								
Crevalle Jack																				
Scup																				
Weakfish																				
Spot																				
Tautog																	287	440	345	4
Cunner																				
Striped Searobin																	281	281	281	1
Summer Flounder																				
Windowpane													221	230	226	2	265	265	265	1
Winter Flounder					242	242	242	1	175	252	220	5	147	250	199	2				
# Fish /Month				62				2				27				147				118

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Gill Nets in Jamaica Bay Fisheries Survey November 1985 to October 1986

	June 1986				August 1986				Early September.1986				Late September 1986				October 1986			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Smooth Dogfish	342	1013	774	13	426	481	461	3	494	494	494	1	511	591	559	8				
Cownose Ray													682	682	682	1				
American Eel																				
Blueback Herring																				
Alewife																				
Atlantic Menhaden	250	356	302	99	265	360	317	122	280	356	317	17	236	349	311	18	81	355	306	35
Lined Seahorse																				
Northern Pipefish									115	125	120	2	190	190	190	1	138	153	144	3
Black Sea Bass	158	158	158	1																
Bluefish	355	622	477	9	90	509	316	9	410	650	530	2	445	788	568	4	715	755	733	3
Crevalle Jack					58	185	122	2												
Scup					77	77	77	1												
Weakfish									400	477	439	2								
Spot													183	183	183	1				
Tautog	142	142	142	1																
Cunner	173	182	178	2																
Striped Searobin	105	105	105	1	185	196	191	2	83	88	86	2	181	283	232	2				
Summer Flounder	296	449	373	2	179	359	298	4	187	255	232	6	274	378	338	3	241	241	241	1
Windowpane	289	289	289	1																
Winter Flounder	58	250	154	2													305	305	305	1
# Fish/Month				131				143				32				38				43

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Gill Nets in Jamaica Bay Fisheries Survey November 1985 to October 1986

Species	Total Single Species all Gill Nets
Smooth Dogfish	36
Cownose Ray	1
American Eel	1
Blueback Herring	60
Alewife	3
Atlantic Menhaden	550
Lined Seahorse	1
Northern Pipefish	6
Black Sea Bass	1
Bluefish	32
Crevalle Jack	2
Scup	1
Weakfish	2
Spot	1
Tautog	5
Cunner	2
Striped Searobin	8
Summer Flounder	16
Windowpane	4
Winter Flounder	11
Total	743

Appendix D

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Beach Seine in Jamaica Bay Fisheries Survey November 1985 to October 1986

	November 1985				Dec. '85-Feb. '86				March 1986				April 1986				May 1986			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Blueback Herring																				
American Shad																				
Bay Anchovy																				
Red Hake													35	35	35	1				
Mummichog													38	38	38	1	38	86	51	23
Striped Killifish	54	75	65	2									79	79	79	1	68	68	68	1
Atlantic Silverside	65	101	76	209									52	116	88	21	54	124	100	139
Lined Seahorse													58	71	65	4	57	73	66	4
Northern Pipefish																	120	201	161	2
Bluefish																	28	31	30	2
Lookdown																				
Northern Kingfish																				
Cunner																				
White Mullet																				
Butterfish																				
Striped Searobin																				
Summer Flounder																				
Winter Flounder																				
Striped Burrfish																				
# Fish/Month				211				0				0				28				171

Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Beach Seine in Jamaica Bay Fisheries Survey
November 1985 to October 1986

	June 1986				August 1986				Early September.1986				Late September 1986				October 1986			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Blueback Herring					136	136	136	1												
American Shad									98	108	103	2								
Bay Anchovy									29	108	41	172								
Red Hake																				
Mummichog	42	90	60	8					32	79	48	21	34	69	49	113	38	72	56	10
Striped Killifish					29	74	44	169	42	104	61	113	45	101	61	252	42	105	71	162
Atlantic Silverside	13	128	79	17	38	118	75	1195	33	135	76	1715	48	115	82	1895	49	118	72	270
Lined Seahorse													61	72	67	2				
Northern Pipefish									107	107	107	1								
Bluefish	48	62	56	6	113	157	132	28					158	194	174	14				
Lookdown													46	46	46	1				
Northern Kingfish	44	44	44	1	45	98	63	3	91	128	113	6	58	202	151	32	72	72	72	1
Cunner									52	52	52	1	42	42	42	1				
White Mullet					84	108	98	6	98	117	106	8	77	145	115	5				
Butterfish					57	57	57	1												
Striped Searobin					53	53	53	1												
Summer Flounder													194	194	194	1				
Winter Flounder	55	55	55	1	85	85	85	1									73	73	73	1
Striped Burrfish													47	47	47	1				
# Fish/Month				33				1405				2039				2316				444

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Beach Seine in Jamaica Bay Fisheries Survey November 1985 to October 1986

Species	Total Single Species all Seines
Blueback Herring	1
American Shad	2
Bay Anchovy	172
Red Hake	1
Mummichog	176
Striped Killifish	700
Atlantic Silverside	5461
Lined Seahorse	10
Northern Pipefish	3
Bluefish	50
Lookdown	1
Northern Kingfish	43
Cunner	2
White Mullet	19
Butterfish	1
Striped Searobin	1
Summer Flounder	1
Winter Flounder	3
Striped Burrfish	1
Total	6296

Appendix E

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 1
Breezy Point

	June 1988				August 1988				September 1988				October 1988				April 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Atlantic Silversides	109	148	129	6	*	*	*	950	*	*	*	435	*	*	*	45	No	Fish		
Northern Kingfish					59	76	68	2	96	200	148	18								
Smallmouth Flounder					41	50	46	3												
Striped Killifish					40	66	53	14												
Blackfish					30	30	30	1												
Bluefish									81	123	102	260								
Red Porgy									130	130	130	1								
Winter Flounder																				
Windowpane																				
#Fish/Seine				6				970				714				45				0
#Species/Seine				1				5				4				1				0

**Minimum (Min), Maximum (Max), Mean Length (Mean),
and Quantity (Q) For Each Fish Species
Captured by Seine Net in Jamaica Bay Fisheries Survey
June 1988 to October 1989**

**Seine Site # 1
Breezy Point**

	June 1989				July 1989				August 1989				September 1989				Total Single Species all Seines	Average Species Catch/Seine
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species																		
Atlantic Silversides	24	31	28	154	*	*	*	1000	*	*	*	72	*	*	*	107	2769	307.66
Northern Kingfish																	20	2.2
Smallmouth Flounder																	3	.33
Striped Killifish																	14	1.5
Blackfish																	1	.11
Bluefish				45	109	77	401										661	73.4
Red Porgy																	1	.11
Winter Flounder	49	61	55	2	91	91	91	1									3	.33
Windowpane	35	35	35	1													1	.11
# Fish/Seine				157				1402				72				107		
Species/Seine				3				3				1				1		
Total																	3473	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) for Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 2
DuBois Point

	June 1988				August 1988				September 1988				October 1988				April 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Striped Killifish	47	58	53	2	67	138	103	40	60	75	68	7	41	120	81	97				
Atlantic Silversides					*	*	*	589					*	*	*	67	91	91	91	1
Northern Kingfish					161	161	161	1												
Blackfish					51	51	51	1												
Mummichog					67	117	92	46					51	77	64	8				
Bluefish									73	107	90	15								
Pipefish																				
Winter Flounder																				
Seahorse																				
# Fish/Seine				2				677				22				172				1
# Species/Seine				1				5				2				2				1

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 2
DuBois Point

	June 1989				July 1989				August 1989				September 1989				Total Single Species all Seines	Average Species Catch/Seine
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species																		
Striped Killifish	62	89	76	6	84	105	95	64	43	81	62	84				11	311	34.5
Atlantic Silversides					*	*	*	175	62	127	95	213	*	*	*	71	1116	124
Northern Kingfish																	1	.11
Blackfish																	1	.11
Mummichog	63	106	85	7	*	*	*	25	*	*	*	24					110	12.2
Bluefish	70	120	95	46	113	127	120	5	95	119	107	16					82	9.1
Pipefish	176	176	176	1													1	.11
Winter Flounder	51	51	51	1					74	77	76	2					3	.33
Seahorse													116	116	116	1	1	.11
# Fish/Seine				61				269				339				83		
# Species/Seine				5				4				5				3		
Total																	1626	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 3
North Channel Bridge

	June 1988				August 1988				September 1988				October 1988				April 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Atlantic Silversides	28	121	75	54	*	*	*	675					*	*	*	105	No	Fish		
Summer Flounder	70	72	71	2																
Striped Killifish	46	106	76	20	33	114	74	24	46	132	89	810	46	58	52	2				
Mummichog	49	71	60	21					29	111	70	85	40	71	56	77				
Banded Killifish	44	51	48	8																
White Perch					102	102	102	1	92	112	102	14								
Bluefish									92	115	104	5								
# Fish/Seine				105				700				914				185				0
# Species/Seine				5				3				4				4				0

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 3
North Channel Bridge

	June 1989				July 1989				August 1989				September 1989				Total Single Species all Seines	Average Species Catch/Seine
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species																		
Atlantic Silversides	*	*	*	500	*	*	*	25*	*	*	*	194	*	*	*	38	1591	176.7
Summer Flounder																	2	.22
Striped Killifish					36	60	48	9	*	*	*	94	*	*	*	20	979	108.7
Mummichog					40	46	43	3									186	20.6
Banded Killifish																	8	.88
White Perch																	15	1.66
Bluefish	56	100	76	9	97	135	116	12	122	137	130	5					31	3.4
# Fish/Seine				509				49				293				58		
# Species/Seine				2				4				3				2		
Total																	2812	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 4
Hangar B

	June 1988				August 1988				September 1988				October 1988				June 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Summer Flounder	65	124	95	13																
Windowpane					53	87	70	2												
Seahorse					57	57	57	1												
Inshore Lizardfish					84	115	71	9												
Northern Kingfish					141	166	154	3												
Striped Killifish					56	67	62	9												
Mummichog					40	73	57	3					36	52	44	3	66	93	80	12
Winter Flounder					86	86	86	1												
Blackfish					54	54	54	1												
Atlantic Silversides					*	*	*	1100	*	*	*	250	*	*	*	262	82	121	102	506
Bluefish									45	156	101	65					77	106	92	57
Smallmouth Flounder													60	60	60	1				
Pipefish																				
# Fish/Seine				13				1129				315				266				575
# Species/Seine				1				9				2				3				3

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 4
Hangar B

	July 1989				August 1989					
	Min	Max	Mean	Q	Min	Max	Mean	Q	Total Single Species all Seines	Average Species Catch/Seine
Species										
Summer Flounder	106	144	125	19					32	4.57
Windowpane									2	.28
Seahorse									1	.14
Inshore Lizardfish									9	1.28
Northern Kingfish									3	.42
Striped Killifish									9	1.20
Mummichog	39	102	71	7					25	3.57
Winter Flounder									1	.14
Blackfish									1	.14
Atlantic Silversides	61	113	87	357	*	*	*	150	2625	32.14
Bluefish					142	172	157	2	124	17.7
Smallmouth Flounder									1	.14
Pipefish	166	199	158	2	197	197	197	1	3	.42
# Fish/Seine				385				153		
# Species/Seine				1				9		
Total									2836	

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 5
Barren Island Marina

	August 1988				September 1988				October 1988				June 1989				July 1989			
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Species																				
Atlantic Needlefish	252	352	302	15																
Northern Kingfish	73	105	89	2	110	130	120	3												
Striped Killifish	*	*	*	125					55	105	80	23								
Spot	125	125	125	1																
Blackfish	37	39	38	2	39	77	58	8												
Bluefish					71	127	64	29												
Weakfish					57	123	90	10									47	55	51	2
Pipefish					60	152	106	60												
Mummichog					41	105	75	10	36	50	43	7					78	78	78	1
Cunner					40	45	43	2												
Northern Searobin					37	43	40	3												
Arrow Goby					25	28	27	2												
Atlantic Silversides					*	*	*	60	*	*	*	86	*	*	*	112	59	68	64	158
Winter Flounder					80	102	91	2									45	65	55	2
Grey Snapper					56	56	56	1												
Striped Searobin									47	47	47	1								
White Mullet									89	89	89	1								
Permit																	18	28	23	6
Yellow Jack																	59	63	61	2
Grubby																	52	52	52	1
# Fish/Seine				145				190				118				112				173
# Species/Seine				5				12				5				1				7

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 5
Barren Island Marina

August 1989

Species	Min	Max	Mean	Q	Total Single Species all Seines	Average Species Catch/Seine
Atlantic Needlefish					15	2.5
Northern Kingfish					5	.83
Striped Killifish	*	*	*	94	242	40.3
Spot					1	.16
Blackfish					10	1.6
Bluefish	125	129	127	2	31	5.16
Weakfish					12	2.0
Pipefish					60	10.0
Mummichog					18	3.0
Cunner					2	.33
Northern Searobin					3	.50
Arrow Goby					2	.33
Atlantic Silversides	*	*	*	150	566	94.3
Winter Flounder					5	.83
Grey Snapper					1	.16
Striped Searobin					1	.16
White Mullet	51	175	113	68	69	11.5
Permit					6	1.0
Yellow Jack	40	75	58	6	8	1.33
Grubby					1	.16
# Fish/Seine				320		
# Species/Seine				5		
Total				1058		

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 6
Plumb Beach

	June 1988				August 1988				September 1988				October 1988				April 1989			
Species	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q
Atlantic Silversides	84	114	99	123	124	130	127	71	**	*	*	60	*	*	*	45	83	121	102	6
Smallmouth Flounder					29	41	35	8												
Northern Kingfish					56	88	72	4	101	101	101	1	73	73	73	1				
Striped Burrfish					49	49	49	1												
Pipefish					75	75	75	1												
Striped Killifish					65	69	67	2	79	79	79	1								
Bluefish									96	138	117	7								
White Mullet									80	137	109	3								
Permit									53	60	57	2								
Winter Flounder													130	130	130	1				
Mummichog																	63	63	63	1
# Fish/Seine				123				87				74				47				67
# Species/Seine				1				6				6				3				2

Minimum (Min), Maximum (Max), Mean Length (Mean), and Quantity (Q) For Each Fish Species Captured by Seine Net in Jamaica Bay Fisheries Survey June 1988 to October 1989

Seine Site # 6
Plumb Beach

	June 1989				July 1989				August 1989				Total Single Species all Seines	Average Species Catch/Seine
	Min	Max	Mean	Q	Min	Max	Mean	Q	Min	Max	Mean	Q		
Species														
Atlantic Silversides	*	*	*	52	30	109	70	84	*	*	*	19	520	65
Smallmouth Flounder					29	41	35	8					8	1.0
Northern Kingfish													6	.75
Striped Burrfish													1	.12
Pipefish					142	222	182	2					3	.37
Striped Killifish													3	.37
Bluefish	60	60	60	1									8	1.0
White Mullet													3	.37
Permit					14	35	25	75					77	9.6
Winter Flounder													1	.12
Mummichog													1	.12
# Fish/Seine				53				161				19		
# Species/Seine				2				3				1		
Total													631	

Appendix F

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 1

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Spotted Hake	4	18.5(s)	*	10ppm(s)	*	*	*	*	3.857
	Winter Flounder	4								
	Cunner	3								
	Porgy	7								
	Lined Seahorse	1								
7/88	Winter Flounder	2	20.4(s)	7.2	9.2(s)	29.1(s)	39.3	366	67	1.044
			17.9(b)	7.2(b)	7.5(b)	28.9(b)	38.1(b)			
8/88	Winter Flounder	6	21.1(s)	7.5(s)	13.4(s)	*	546(s)	544	211	.70
	Black Sea Bass	1	20.8(b)	7.3(b)	10.5(b)	*	564(b)			
9/88	No Fish	0	17.4(s)	9.6(s)	8.4(s)	21.3(s)	570(s)	175	0	.072
			173.(b)	8.5(b)	8.4(b)	215.(b)	568(b)			
10/88	Winter Flounder	11	12.7(s)	7.8(s)	*	26.4(s)	334(s)	*	*	.28
	Red Hake	1	12.6(b)	7.3(b)	*	28.1(b)	335(b)			
	Black Sea Bass	1								
	Northern Pipefish	1								
	Northern Searobin	1								
	Spotfin Butterflyfish		1							
	Bigeye	1								
11/88	Winter Flounder	15	8.4(s)	*	6.6(s)	25.9(s)	249(s)	425	132	.096
	Red Hake	8	7.9(b)	*	6.3(b)	23.3(b)	264(b)			
	Windowpane	8								
	Grubby	7								
	Smallmouth Flounder		7							
	Rock Gunnel	1								
5/89	No Fish	0	12.9(s)	7.5(s)	10.8(s)	23.9(s)	383(s)	*	*	.32
			12.4(b)	7.7(b)	9.7(b)	23.6(b)	365(b)			
6/89	Clearnose Skate	1	18.1(s)	8.1(s)	*	25.7(s)	434(s)	99	0	.36
	Winter Flounder	1	17.6(b)	*	*	26.4(b)	446(b)			
	Butterfish	1								
7/89	Winter Flounder	11	22.2(s)	7.3(s)	6.8(s)	27.2(s)	449(s)	812	203	.32
			22.1(b)	7.6(b)	6.5(b)	27.7(b)	448(b)			
8/89	Red Porgy	1	21.5(s)	7.3(s)	7.1(s)	27.5(s)	443(s)	*	*	.36
	Northern Searobin	2	21.6(b)	7.5(b)	7.0(b)	26.8(b)	442(b)			

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
8/89	Winter Flounder	10								
	Windowpane	1								
	Northern Pipefish	1								
9/89	Red Porgy	1	22.5(s)	7.1(s)	6.5(s)	26.5(s)	434(s)	1218	0	.32
	Spotfin Butterflyfish	1	22.2(b)	7.4(b)	6.3(b)	27.1(b)	433(b)			

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 2

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Windowpane	7	20(s)	8.1(s)	11.5(s)	28.4(s)	*	*	*	*
	Winter Flounder	3	17.2(b)	*	8.0(b)	*	*			
	Smallmouth Flounder		1							
7/88	Winter Flounder	3	20.5(s)	7.1(s)	8.5(s)	28.7(s)	397(s)	988	122	1.798
8/88	Tautog	1	21.0(s)	7.7(s)	10.5(s)	*	561(s)	122	44	1.044
			20.7(b)	7.8(b)	10.6(b)	*	564(b)			
9/88	Tautog	1	18.0(s)	7.2(s)	8.1(s)	21.6(s)	552(s)	250	100	.092
	Northern Pipefish	1	17.5(b)	7.3(b)	8.1(b)	22.0(b)	453(b)			
10/88	Atlantic Silverside	1	12.4(s)	7.8(s)	*	28.4(s)	323(s)	*	*	.112
6/89	Red Porgy	1	18.2(s)	6.6(s)	*	24.0(s)	431(s)	330	22	.44
	Red Hake	1	17.1(b)	6.5(b)	*	27.3(b)	458(b)			
	Smallmouth Flounder	1								
	Winter Flounder	2								
	Northern Searobin	1								
7/89	Tautog	5	22.0(s)	7.7(s)	7.8(s)	28.0(s)	464(s)	4350	8091	.87
	Windowpane	5	21.8(b)	7.7(b)	7.5(b)	21.8(b)	464(b)			
	Red Porgy	3								
	Winter Flounder	1								
	Lined Seahorse	1								
8/89	Winter Flounder	7	22.4(s)	7.4(s)	8.4(s)	26.5(s)	435(s)	4158	69	.16
	Orange Filefish	2	21.9(b)	7.4(b)	7.5(b)	26.8(b)	443(b)			
	Windowpane	1								
	Tautog	4								
	Northern Searobin	1								
9/89	No Fish	0	22.7(S)	7.5(s)	6.9(s)	26.2(s)	436(s)	1073	0	.32
			22.4(b)	7.5(b)	4.9(b)	26.5(b)	450(b)			

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 3

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Windowpane	7	23.0(s)	8.4(s)	*	27.1(s)	*	44	6	5.075
	Smallmouth Flounder	5	21.0(b)	*	*	*	*			
	Spotted Hake	2								
	Tautog	1								
	Porgy	16								
	Winter Flounder	45								
7/88	Windowpane	33	22.3(s)	7.2(s)	(9.0(s)	28.2(s)	407(s)	799	311	2.03
	Smallmouth Flounder	3	21.3(b)	7.1(b)	7.2(b)	28.2(b)	402(b)			
	Porgy	5								
8/88	Summer Flounder	1	20.8(s)	7.3(s)	9.1(s)	*	563(s)	333	33	.092
			20.6(b)	7.3(b)	9.0(b)	*	486(b)			
9/88	Winter Flounder	2	17.8(s)	7.2(s)	7.8(s)	22.0(s)	545(s)	588	200	.08
	Windowpane	7	17.6(b)	7.2(b)	7.2(b)	22.0(b)	504(b)			
	Planehead Filefish	1								
	Northern Stargazer	1								
	Northern Searobin	1								
10/88	Windowpane	9	12.4(s)	7.8(s)	*	24.9(s)	320(s)	*	*	.40
	Winter Flounder	14	12.9(b)	7.6(b)	*	26.6(b)	333(b)			
	Smallmouth Flounder	3								
	Black Sea Bass	1								
5/89	No Fish	0	14.9(s)	7.4(s)	8.7(s)	19.6(s)	358(s)	4166	1155	*
			13.8(b)	7.4(b)	7.4(b)	21.7(b)	367(b)			
6/89	Summer Flounder	1	19.5(s)	8.0(s)	*	23.7(s)	400(s)	1034	385	.36
	Winter Flounder	13	18.2(b)	9.0(b)	*	26.2(b)	431(b)			
	Windowpane	2								
7/89	Red Porgy	1	22.1(s)	7.2(s)	5.3(s)	24.4(s)	433(s)	4466	6670	.28
	Windowpane	20	22.1(b)	7.3(b)	5.9(b)	26.2(b)	379(b)			
	Summer Flounder	1								
8/89	Winter Flounder	7	22.4(s)	7.4(s)	8.4(s)	26.5(s)	435(s)	4158	69	.24
	Orange Filefish	2	21.9(b)	7.4(b)	7.5(b)	26.8(b)				
	Windowpane	1								
	Tautog	4								
	Northern Searobin	1								
9/89	Winter Flounder	12	22.9(s)	7.5(s)	6.2(s)	25.9(s)	444(s)	1305	0	.32
	Orange Eilefish	1	22.2(b)	7.5(b)	5.8(b)	26.8(b)	419(b)			
	Striped Searobin	1								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 4

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Winter Flounder	27	22.2(s)	8.4(s)	13.8(s)	28.4(s)	*	0	0	5.604
	Windowpane	1620.0(b)		*	11.5	*	*			
	Smallmouth Flounder	1								
7/88	Winter Flounder	30	23.4(s)	7.0(s)	8.5(s)	27.9(s)	413(s)	710	189	2.90
	Summer Flounder	2	23.2(b)	7.0(b)	8.2(b)	28.2(b)	411(b)			
	Clearnose Skate	1								
	Spiny Dogfish	1								
	Porgy	4								
	Windowpane	1								
8/88	Orange Filefish	1	21.6(s)	7.3(s)	11.6(s)	*	543(s)	500	22	1.914
	Northern Puffer	4	21.4(b)	7.2(b)	10.7(b)	*	545(b)			
	Striped Searobin	19								
	Lined Seahorse	1								
	American Eel	1								
	Northern Kingfish	1								
	Black Sea Bass	9								
	Spotfin Butterflyfish	3								
	Cunner	2								
	Smallmouth Flounder	11								
9/88	Northern Searobin	74	19.1(s)	7.2(s)	8.6(s)	21.4(s)	535(s)	113	0	.064
	Summer Flounder	1	18.5(b)	7.2(b)	8.3(b)	21.5(b)	535(b)			
	Smallmouth Flounder	8								
	Butterfish	1								
	Windowpane	8								
	Four-spot Flounder	1								
	Northern Stargazer	1								
	Lined Seahorse	2								
	Black Sea Bass	1								
	Winter Flounder	6								
	Northern Pipefish	1								
	Northern Kingfish	2								
	Goby sp.	1								
	Smooth Dogfish	1								
10/88	Scup	1	12.7(s)	7.8(s)	*	28.9(s)	558(s)	*	*	.32
	Winter Flounder	4	12.5(b)	7.3(b)	*	26.6(b)	580(b)			
	Smallmouth Flounder	4								
	Windowpane	2								
	Lined Seahorse	1								
12/88	Atlantic Herring	1	*	*	*	*	*	344	200	*
1/89	Windowpane	1	*	*	*	*	*	333	89	*
	Winter Flounder	1								
5/89	Northern Pipefish	1	15.7(s)	7.2(s)	9.6(s)	19.5(s)	356(s)	1188	99	*
	Spotted Hake	2	14.3(b)	7.5(b)	7.3(b)	19.6(b)	362(b)			
6/89	No Fish	0	20.3(s)	8.3(s)	*	22.7(s)	379(s)	77	0	.44
			19.6(b)	9.3(b)	*	23.7(b)	392(b)			
7/89	Winter Flounder	8	22.3(s)	7.4(s)	5.0(s)	25.5(s)	429(s)	5467	3016	.36
	Lined Seahorse	1	22.3(b)	7.4(b)	4.9(b)	26.3(b)	410(b)			
	Northern Searobin	1								
	American eel	1								
8/89	Inshore Lizardfish	1	23.1(s)	7.7(s)	8.2(s)	26.8(s)	429(s)	19966	69	.52
	Winter Flounder	2	23.3(b)	7.5(b)	7.7(b)	26.6(b)	428(b)			
	Summer Flounder	3								
	American Eel	1								
9/89	Summer Flounder	1	23.5(s)	7.5(s)	7.3(s0	25.2(s)	426(s)	464	0	.36
	Winter Flounder	12	22.8(b)	7.6(b)	5.4(b)	25.6(b)	433			
	Windowpane	4								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 5

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T. Col.	F. Col.	Chlphyl a
6/88	Tautog	2	23.0(s)	8.4(s)	13.0(s)	*	*	144	11	7.105
			20.5(b)	*	8.2(b)	*	*			
7/88	Winter Flounder	63	25.5(s)	7.5(s)	11.8(s)	27.3(s)	420(s)	1543	100	4.466
	Windowpane	34	21.5(b)	7.2(b)	6.8(b)	28.2(b)	404(b)			
	Smallmouth Flounder	5								
	Tautog	5								
	Spiny Dogfish	3								
	Spotted Hake	3								
	Clearnose Skate	2								
	Northern Searobin	1								
	Cunner	1								
	Summer Flounder	3								
8/88	No Fish	0	*	*	*	*	*	309	56	2.008
9/88	No Fish	0	18.2(s)	7.4(s)	9.5(s)	21.0(s)	530(s)	25	0	.38
			17.1(b)	7.2(b)	8.2(b)21.9(b)		553(b)			
10/88	Weakfish	1	12.8(s)	7.3(s)	9.8(s)	27.0(s)	550(s)	122	13	.42
	Winter Flounder	13	12.7(b)	7.3(b)	8.5(b)	27.1(b)	553(b)			
	Four-spot Flounder	1								
	Smallmouth Flounder	9								
	Northern Stargazer	1								
12/88	Winter Flounder	12	*	*	*	*	*	322	155	*
	Grubby	2	6(b)	7.6(b)	14.6(b)	25.0(b)	280(b)			
1/89	Winter Flounder	110	*	*	*	*	*	78	33	*
	Atlantic Silverside	1	4(b)	7.8(b)	16.4(b)	26.0(b)	265(b)			
	Bluebacked Herring	2								
	Grubby	8								
	Windowpane	1								
2/89	Bluebacked Herring	7	*	*	*	*	*	56	11	*
	White Perch	2	6(b)	*	14.2(b)	26.0(b)	260(b)			
	Grubby	36								
	Windowpane	3								
	Oyster Toadfish	1								
	Winter Flounder	243								
3/89	Winter Flounder	668	5(s)	8.1(s)	18.6(s)	27.0(s)	270(s)	99	33	*
	Windowpane	2	6(b)	7.9(b)	15.8(b)	27.0(b)	350(b)			
	Bluebacked Herring	12								
	Cunner	1								
	Grubby	6								
	Spotted Hake	1								
5/89	Winter Flounder	6	16.2(s)	7.9(s)	9.6(s)	19.6(s)	356(s)	935	33	*
			14.7(b)	7.8(b)	7.2(b)	22.1(b)	361(b)			
7/89	Tomcod	5	23.0(s)	7.3(s)	4.4(s)	24.7(s)	424(s)	6061	580	.64
	Alewife	1	22.5(b)	7.3(b)4.6(b)		27.1(b)	425(b)			
	Winter Flounder	28								
	Windowpane	3								
	Red Porgy	1								
8/89	Windowpane	3	23.2(s)	7.8(s)	9.2(s)	25.2(s)	418(s)	804	276	.64
	Winter Flounder	9	22.7(b)	7.6(b)	9.1(b)	25.3(b)	433(b)			
	Summer Flounder	2								
9/89	Red Hake	1	23.5(s)	7.7(s)	7.5(s)	25.1(s)	426(s)	348	0	*
	Weakfish	2	23.0(b)	7.6(b)	4.0(b)	26.5(b)	440(b)			
	Windowpane	1								
	Bluespotted Cornetfish	3								
	Striped Searobin	4								
	Tautog	3								
	Winter Flounder	12								
	Lined Seahorse	2								
	Smallmouth Flounder	1								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 6

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Porgy	1	23.0(s)	8.4(s)	12.0(s)	28.4(s)	*	261	0	6.902
	Winter Flounder	5	22.0(b)	*	12.0(b)	*	*			
7/88	Winter Flounder	20	24.5(s)	7.3(s)	10.2(s)	25.6(s)	391(s)	2831	377	6.699
	Spiny Dogfish	2								
	Windowpane	4								
	Summer Flounder	1								
8/88	Northern Stargzer	1	*	*	*	*	*	Con	890	1.566
	Northern Kingfish	2	*	*	*	*	*			
	Striped Searobin	7								
	Weakfish	56								
	Summer Flounder	1								
	Windowpane	4								
	Winter Flounder	8								
	Smallmouth Flounder	3								
	Four-spot Flounder	4								
9/88	Winter Flounder	114	18.2(s)	7.3(s)	9.6(s)	21.6(s)	524(s)	25	50	.22
	Smallmouth Flounder	5	17.9(b)	7.1(b)	7.7(b)	21.8(b)	536(b)			
	Northern Kingfish	1								
	Atlantic Silverside	1								
	American Eel	1								
	Inshore Lizardfish	1								
	Windowpane	8								
	Weakfish	20								
	Red Porgy	1								
	Spotfin Butterflyfish	1								
	Tautog	3								
	Striped Searobin	5								
	Oyster Toadfish	1								
	Orange Filefish	1								
10/88	Smallmouth Flounder	11	11.0(s)	7.3(S)	9.9(s)	27.4(s)	537(s)	1600	400	.48
	Red Hake	6	11.0(b)	7.2(b)	8.9(b)	27.6(b)	539(b)			
	Windowpane	4								
	Winter Flounder	1								
11/88	Red Hake	29	7.6	*	*	25.2	262	800	121	.30
	Winter Flounder	20	7.2(b)	*	*	25.0(b)	259			
	Windowpane	8								
	Smallmouth Flounder	3								
	Grubby	6								
	Rock Gunnel	1								
12/88	Whiting	1	*	*	*	*	*	500	278	*
	Grubby	2	5.0(b)	7.9(b)	13.0(b)	25.0(b)	255(b)			
	Winter Flounder	1								
2/89	Striped Bass	1	*	*	*	*	*	22	0	*
	White Perch	2								
	Winter Flounder	171								
	Windowpane	1								
	Grubby	26								
	Smallmouth Flounder		2							
6/89	Winter Flounder	8	21.3(s)	7.5(s)	*	21.6(s)	367(s)	275	88	.24
			20.4(b)	7.4(b)	*	21.0(b)	375(b)			
8/89	Summer Flounder	1	23.3(s)	7.8(s)	10.5(s)	25.4(s)	418(s)	402	0	.68
			22.7(b)	7.2(b)	6.2(b)	26.2(b)	409			
9/89	Tautog	2	23.5(s)	7.5(s)	6.8(s)	24.8(s)	415(s)	1131	203	.36
	Summer Flounder	1	23.1(b)	7.7(b)	4.2(b)	25.5	440(b)			
	Winter Flounder	10								
	Windowpane	2								
	Oyster Toadfish	2								
	Cunner	1								
10/89	Tautog	2	*	*	*	*	*	1005	200	.28
	Spotfin Butterflyfish	1								
	Winter Flounder	7								
	[illegible]	[illegible]								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 7

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Porgy	110	22.5(s)	8.4(s)	*	*	*	255	78	4.872
	Winter Flounder	65	*	*	11.2(b)	*	*			
	Northern Pipefish	2								
	Oyster Toadfish	2								
	Northern Searobin	1								
	Summer Flounder	1								
7/88	Winter Flounder	1	24.6(s)	7.3(s)	9.7(s)	26.1(s)	392	1976	278	5.481
	Oyster Toadfish	1	23.2(b)	7.1(b)	8.3(b)	27.5(b)	409(b)			
	Summer Flounder	1								
8/88	Planehead Filefish	1	*	*	*	*	*	Con	5400	2.03
	Tautog	11								
	Cunner	1								
	Bluespotted Cornetfish	1								
9/88	Winter Flounder	23	18.1(s)	7.2(s)	8.5(s)	21.9(s)	529(s)	50	50	.38
	Black Sea Bass	1	17.8(b)	7.1(b)	8.1(b)	22.0(b)	537			
	Tautog	2								
10/88	Winter Flounder	4	10.8(s)	7.1(s)	9.5(s)	27.2(s)	529(s)	1300	500	.32
	Northern Searobin	1	10.8(b)	7.1(b)	9.1(b)	27.2(b)	537(b)			
11/88	Winter Flounder	9	7.7(s)	*	*	25.0(s)	259(s)	330	132	.172
	Windowpane	3	7.5(b)	*	*	24.5(b)	257			
	Smallmouth Flounder	3								
	Spotted Hake	3								
	Tautog	1								
	Cunner	1								
12/88	Windowpane	5	*	*	*	*	*	278	178	*
	Grubby	5	6.0(b)	7.9(b)	13.2(b)	25.0(b)	255(b)			
	Winter Flounder	3								
6/89	Winter Flounder	11	22.1(s)	9.0(s)	*	22.1(s)	366(s)	242	44	.40
	Red Porgy	4	22.1(b)	8.1(b)	*	22.2(b)	365(b)			
	Naked Goby	2								
	Red Hake	1								
	Tautog	2								
	Windowpane	2								
7/89	Red Porgy	45	23.7(s)	7.3(s)	4.2(s)	23.9(s)	405(s)	928	203	.40
	Winter Flounder	26	22.7(b)	7.3(b)	4.0(b)	25.8(b)	420(b)			
	Cunner	2								
	Northern Searobin	3								
	Summer Flounder	12								
	Oyster Toadfish	3								
	Windowpane	1								
	Tautog	1								
8/89	Red Porgy	8	23.2(s)	8.0(s)	8.9(s)	25.9(s)	420(s)	2479	276	.60
	Hogchoker	1	23.3(b)	7.6(b)	9.1(b)	25.7(b)	386(b)			
	Tautog	1								
	Weakfish	1								
	Oyster Toadfish	16								
	Winter Flounder	90								
	Summer Flounder	4								
	Grubby	1								
	Northern Searobin	1								
9/89	Winter Flounder	26	23.5(s)	7.6(s)	6.5(s)	24.6(s)	416(s)	2103	71	.36
	Planehead Filefish	2	23.1(b)	7.6(b)	7.2(b)	25.3(b)	421			
10/89	Oyster Toadfish	2	*	*	*	*	*	938	116	.32
	Winter Flounder	81								
	Planehead Filefish	1								
	Scup	1								
	Northern Searobin	1								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 8

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Winter Flounder	85	23.0(s)	8.4(s)	15.0(s)	28.4(s)	*	217	50	5.887
	Windowpane	1	27.5(b)	*	10.8(b)	*	*			
	Northern Pipefish	2								
	Porgy	9								
	Spotted Hake	8								
	Oyster Toadfish	4								
	Northern Searobin	1								
7/88	Winter Flounder	1	24.6(s)	7.4(s)	10.1(s)	25.3(s)	386(s)	Con	2331	4.669
			23.3(b)	7.2(b)	6.0(b)	27.5(b)	405(b)			
8/88	Winter Flounder	27	*	*	*	*	*	9200	4700	2.32
	Smallmouth Flounder	1	*	*	*	*	*			
	Weakfish	26								
	Striped Searobin	2								
	Porgy	1								
9/88	Winter Flounder	5	18.2(s)	7.1(s)	8.8(s)	21.7(s)	521(s)	138	0	.38
			18.1(b)	7.0(b)	6.6(b)	22.1(b)	524(b)			
10/88	Winter Flounder	31	10.7(s)	7.7(s)	9.3(s)	27.3(s)	523(s)	725	250	.36
			10.5(b)	7.3(b)	7.5(b)	27.3(b)	528(b)			
6/89	Winter Flounder	15	22.1(s)	7.8(s)	*	20.6(s)	353(s)	253	11	.52
	Spotted Hake	3	21.1(b)	8.4(b)	*	20.9(b)	363(b)			
	Red Hake	1								
	Oyster Toadfish	1								
	Northern Pipefish	1								
7/89	Red Porgy	6	23.9(s)	7.3(s)	4.0(s)	23.8(s)	398(s)	667	0	.36
	Oyster Toadfish	3	23.1(b)	7.2(b)	3.1(b)	24.5(b)	404(b)			
	Winter Flounder	8								
	Summer Flounder	1								
	Northern Searobin	2								
8/89	Weakfish	6	23.7(s)	7.9(s)	9.3(s)	25.2(s)	416(s)	40066	138	.56
	Red Porgy	2	23.6(b)	7.5(b)	5.3(b)	23.9(b)	404(b)			
	Oyster Toadfish	10								
	Summer Flounder	4								
	Northern Searobin	1								
	Orange Filefish	2								
	Winter Flounder	33								
	Windowpane	3								
9/89	Winter Flounder	1	23.2(s)	7.5(s)	7.5(s)	24.3(s)	415(s)	3000	0	.36
	Inshore Lizardfish	1	23.0(b)	7.5(b)	7.1(b)	24.9(b)	407(b)			
	Northern Pipefish	2								
	Northern Searobin	1								
	Northern Puffer	1								
10/89	Striped Bass	1	*	*	*	*	*	3400	938	.36
	Winter Flounder	152	*	*	*	*	*			
	Northern Searobin	2								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 9

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	No Fish	0	23.0(s)	8.6(s)	*	33.7(s)	*	228	33	6.902
			*	*	*	*	*			
7/88	Winter Flounder	37	25.1(s)	7.3(s)	8.6(s)	24.9(s)	383(s)	TNC	TNC	5.481
	Lined Seahorse	4	24.9(b)	7.1(b)	5.0(b)	26.1(b)	397(b)			
	Northern Pipefish	1								
	Summer Flounder	1								
8/88	Porgy	4	*	*	*	*	*	6100	4300	2.494
	Weakfish	1	*	*	*	*	*			
	Boston Blackie	2								
	Cunner	2								
	Tautog	3								
	Oyster Toadfish	2								
9/88	Butterfish	2	19.5(s)	6.1(s)	7.3(s)	21.2(s)	495(s)	1367	350	.40
	Winter Flounder	3	19.5(b)	6.3(b)	6.0(b)	21.2(b)	493(b)			
	Smallmouth Flounder	1								
10/88	Winter Flounder	2	10.9(s)	7.7(s)	8.3(s)	27.5(s)	507(s)	TNC	2300	.60
			10.7(b)	7.3(b)	7.0(b)	27.9(b)	517(b)			
6/89	No Fish	0	22.4(s)	9.0(s)	*	18.7(s)	342(s)	*	*	.44
			21.4(b)	7.8(b)	*	19.0(b)	351(b)			
7/89	No Fish	0	24.0(s)	7.2(s)	2.7(s)	22.9(s)	386(s)	1160	87	.32
			23.5(b)	7.1(b)	1.4(b)	23.9(b)	378(b)			
8/89	Winter Flounder	3	24.1(s)	7.6(s)	5.7(s)	24.5(s)	404(s)	7772	138	.56
	Red Porgy	1	23.9(b)	7.3(b)	5.0(b)	24.0(b)	411(b)			
	Orange Filefish	1								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 10

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Oyster Toadfish	1	* *	8.4(s) *	* *	28.4(s) *	* *	250	95	5.887
7/88	No Fish	0	25.2(s) 24.9(b)	7.4(s) 7.1(b)	9.6(s) 8.5(b)	24.3(s) 25.3(b)	373(s) 384(b)	TNC	TNC	9.947
8/88	No Fish	0	* *	* *	* *	* *	* *	7300	1066	1.392
9/88	Northern Kingfish	4	19.5(s) 18.6(b)	6.9(s) 6.8(b)	8.6(s) 7.2(b)	21.1(s) 21.0(b)	514(s) 502(b)	100	50	.87
10/88	No Fish	0	10.7(s) 10.7(b)	7.2(s) 7.1(b)	8.9(s) 7.8(b)	27.5(s) 27.8(b)	583(s) 514(b)	167	50	.40
6/89	No Fish	0	22.6(s) 20.9(b)	7.6(s) 7.4(b)	* *	18.2(s) 17.4(b)	342(s) 352(b)	*	*	*
8/89	No Fish	0	24.6(s)	7.8(s)	6.9(s)	23.7(s)	394(s)	603	69	.72

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 11

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	No Fish	0	17.7(s)	7.8(s)	*	33.7(s)	*	211	0	.08
			*	*	*	*	*			
7/88	Winter Flounder	8	25.3(s)	7.5(s)	10.4(s)	25.6(s)	393(s)	1077	677	7.105
	Lined Seahorse	1		24.7(b)	7.1(b)	4.5(b)	24.1(b)	369(b)		
8/88	Four-spine Stickleback	1	*	*	*	*	*	Con	790	1.74
			*	*	*	*	*			
8/88	Spot	128	20.1(s)	6.3(s)	9.0(s)	22.4(s)	490(s)	13	0	.87
	Winter Flounder	10	18.5(b)	6.7(b)	6.5(b)	22.1(b)	487(b)			
	Weakfish	6								
	Oyster Toadfish	2								
	Striped Searobin	1								
	Tautog	1								
1/89	Winter Flounder	1	*	*	*	*	*	67	44	*
			3.0(b)	7.9(b)	18.0(b)	26.0(b)	235(b)			
7/89	No Fish	0	25.2(s)	7.6(s)	4.5(s)	22.4(s)	378(s)	638	0	*
			23.5(b)	7.1(b)	1.6(b)	23.9(b)	398(b)			
8/89	Red Porgy	4	24.4(s)	7.9(s)	11.1(s)	23.3(s)	385(s)	804	0	.80
			24.1(b)	7.5(b)	6.4(b)	22.9(b)	393(b)			
9/89	Inshore Lizardfish	1	23.7(s)	7.6(s)	7.7(s)	23.1(s)	391(s)	2000	29	.40
	Winter Flounder	1	21.8(b)	7.3(b)	4.5(b)	24.5(b)	418(b)			
	Northern Puffer	1								
	Northern Pipefish	1								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 12

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Striped Searobin	1	22.2(s)	8.2(s)	*	33.7(s)	*	156	122	.812
	Porgy	1	*	*	*	*	*			
	Summer Flounder	2								
	Windowpane	1								
	Winter Flounder	8								
	Smallmouth Flounder	1								
	Northern Pipefish	1								
7/88	Winter Flounder	22	25.5(s)	7.3(s)	13.3(s)	26.9(s)	411(s)	1454	211	4.263
	Windowpane	3	24.3(b)	7.1(b)	7.1(b)	27.1(b)	406(b)			
	Porgy	3								
	Bay Anchovy	4								
	Atlantic Silverside	1								
8/88	Porgy	1	*	*	*	*	*	66	44	1.102
	Northern Kingfish	3	*	*	*	*	*			
	Atlantic Silverside		1							
	Winter Flounder	1								
9/88	Tautog	5	19.2(s)	6.8(s)	8.2(s)	22.4(s)	522(s)	38	0	.52
	Winter Flounder	4	18.8(b)	6.8(b)	7.3(b)	22.8(b)	514(b)			
	Oyster Toadfish	1								
	Striped Searobin	8								
	Atlantic Silverside	12								
	American Eel	1								
	Northern Pipefish	2								
	Lined Seahorse	1								
	Smallmouth Flounder	3								
	Arrow Goby	2								
10/88	Winter Flounder	1	10.8(s)	7.1(s)	9.2(s)	27.6(s)	519(s)	56	0	.42
	Smallmouth Flounder	3	10.5(b)	7.1(b)	8.3(b)	27.1(b)	524(b)			
11/88	Winter Flounder	11	8.0(s)	*	7.0(s)	23.4(s)	254(s)	167	78	.72
	Smallmouth Flounder	1	7.7(b)	*	7.2(b)	23.8(b)	255(b)			
6/89	No Fish		22.9(s)	8.1(s)	*	18.4(s)	340(s)	*	*	.40
			20.1(b)	7.3(b)	*	19.8(b)	363(b)			
7/89	Summer Flounder	4	25.1(s)	7.3(s)	3.2(s)	23.5(s)	386(s)	1189	0	.44
	Winter Flounder	4	23.3(b)	7.1(b)	2.0(b)	23.6(b)	360(b)			
	Red Porgy	13								
8/89	No Fish	0	24.6(s)	7.6(s)	9.1(s)	23.9(s)	395(s)	603	69	.56
			24.9(b)	7.3(b)	4.4(b)	23.5(b)	396(b)			
9/89	Red Porgy	5	23.7(s)	7.6(s)	5.1(s)	23.4(s)	409(s)	232	0	.36
	Summer Flounder	5	23.5(b)	7.5(b)	4.4(b)	24.5(b)	412(b)			
	Weakfish	2								
	Atlantic Silverside	31								
	Winter Flounder	3								
	Striped Searobin	2								
	Northrn Pipefish	1								
	Blackmouth Bass	1								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 13

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Winter Flounder	10	21.1(s)	8.4(s)	*	33.7(s)	*	284	0	1.45
	Summer Flounder	1	*	*	*	*	*			
	Porgy	1								
	Windowpane	4								
7/88	Winter Flounder	11	26.0(s)	7.3(s)	12.6(s)	26.7(s)	414(s)	1221	78	3.451
	Porgy	4	24.4(b)	7.1(b)	9.3(b)	27.4(b)	406(b)			
	Northern Pipefish	2								
8/88	Weakfish	8	22.9(s)	7.4(s)	*	*	*	167	44	.986
	Atlantic Silverside	1	22.5(b)	*	*	*	*			
	Oyster Toadfish	1								
9/88	Red Porgy	2	19.7(s)	7.2(s)	7.0(s)	23.)(s)	505(s)	150	150	.132
	Winter Flounder	17	18.9(b)	6.9(b)	6.0(b)	23.3(b)	505(b)			
	Black Sea Bass	2								
	Striped Searobin	23								
	Weakfish	3								
	Oyster Toadfish	1								
	Smallmouth Flounder	1								
	Northern Pipefish	1								
	Tautog	1								
	American Eel	1								
10/88	Winter Flounder	7	10.6(s)	7.1(s)	8.0(s)	27.8(s)	540(s)	200	0	*
	Windowpane	2	10.3(b)	7.1(b)	7.0(b)	28.0(b)	513(b)			
	Smallmouth Flounder	9								
	Tautog	1								
	Black Sea Bass	2								
6/89	Winter Flounder	2	23.6(s)	8.0(s)	*	18.9(s)	339(s)	473	22	.40
	Red Porgy	1	20.9(b)	7.3(b)	*	20.0(b)	361(b)			
	Tautog	1								
7/89	Summer Flounder	1	24.4(s)	7.3(s)	3.4(s)	23.3(s)	387(s)	4118	319	.36
	Winter Flounder	2	23.7(b)	7.2(b)	3.5(b)	24.4(b)	405(b)			
	Lined Seahorse	1								
8/89	Weakfish	1	24.2(s)	7.8(s)	7.7(s)	24.1(s)	398(s)	871	0	.48
	Red Porgy	5	24.0(b)	7.6(b)	8.0(b)	23.4(b)	404(b)			
	NorthernSearobin	1								
	Lined Seahorse	1								
	Northern Pipefish	1								
9/89	Winter Flounder	17	21.8(s)	7.6(s)	6.1(s)	24.1(s)	416(s)	609	0	.36
	Northern Pipefish	3	23.3(b)	7.5(b)	5.7(b)	24.5(b)	418(b)			

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 14

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Winter Flounder	1	21.1(s)	8.2(s)	*	33.7(s)	*	189	56	1.74
	Northern Pipefish	5	*	*	*	*	*			
	Lined Seahorse	1								
7/88	Winter Flounder	5	24.0(s)	7.2(s)	9.6(s)	27.1(s)	40.9(s)	966	266	1.74
	Porgy	32	23.9(b)	7.1(b)	8.6(h)	27.0(b)	406(b)			
	Northern Pipefish	1								
	Lined Seahorse	8								
8/88	Northern Kingfish	10	*	*	*	*	*	1077	699	3.045
	Northern Searobin	2	*	*	*	*	*			
	Winter Flounder	12								
	Black Sea Bass	1								
	Weakfish	3								
	Summer Flounder	3								
	Northern Pipefish	1								
	Smallmouth Flounder	1								
	Lined Seahorse	6								
	Oyster Toadfish	2								
	Tautog	2								
9/88	Winter Flounder	51	19.3(s)	7.0(s)	7.2(s)	22.5(s)	491(s)	88	100	.092
	Red Porgy	3	19.1(b)	7.0(b)	5.7(b)	23.2(b)	504(b)			
	Northern Kingfish	1								
	Striped Searobin	14								
	Inshore Lizardfish	1								
	Lined Seahorse	2								
	Smallmouth Flounder	24								
	Oyster Toadfish	1								
	Black Sea Bass	9								
11/88	Winter Flounder	8	8.2(s)	*	6.3(s)	24.7(s)	263(s)	111	22	.232
	Smallmouth Flounder	3	8.1(b)	*	6.1(b)	24.8(b)	266(b)			
	Atlantic Silverside	4								
5/89	Tautog	3	17.1(s)	8.0(s)	10.9(s)	19.0(s)	347(s)	1166	55	*
	Winter Flounder	2	16.2(b)	7.8(b)	8.6(b)	20.8(b)	352(b)			
	Northern Pipefish	19								
	Lined Seahorse	4								
	Spotted Hake	1								
	Grey Snapper	1								
	Rock Gunnel	3								
6/89	Winter Flounder	1	21.3(s)	7.5(s)	*	19.9(s)	359(s)	539	209	.40
	Norther Pipefish	1	20.8(b)	7.3(b)	*	20.1(b)	364(b)			
	Tautog	2								
7/89	Summer Flounder	1	24.4(s)	7.3(s)	3.4(s)	23.3(s)	387(s)	4118	319	.36
	Winter Flounder	2	23.7(b)	7.2(b)	3.5(b)	24.4(b)	405(b)			
	Lined Seahorse	1								
8/89	Tautog	1	23.9(s)	8.1(s)	11.6(s)	24.5(s)	404(s)	1742	138	.50
			23.7(b)	7.6(b)	8.2(b)	25.2(b)	409(b)			
9/89	Lined Seahorse	2	23.8(s)	7.6(s)	7.8(s)	24.3(s)	413(s)	348	0	.32
	Northern Kingfish	1	23.6(b)	7.6(b)	5.6(b)	24.3(b)	384(b)			
	Winter Flounder	12								

Data for Trawl Sites in Jamaica Bay
June 1988 to October 1989
Trawl Site 15

Date	Species	Quant.	Temp.	pH	DO	Sal.	Con.	T Col.	F. Col.	Chlphyl a
6/88	Winter Flounder	4	21.1(s)	8.0(s)	*	33.7(s)	*	67	28	2.03
	Porgy	4	*	*	*	*	*			
	Summer Flounder	1								
	Clearnosed Skate	2								
7/88	Winter Flounder	9	23.8(s)	7.2(s)	10.8(s)	27.5(s)	411(s)	733	167	5.684
	Porgy	5	23.3(b)	7.2(b)	9.4(b)	27.9(b)	409(b)			
	Northern Pipefish	1								
	Summer Flounder	1								
	Striped Bass	1								
8/88	Smallmouth Flounder	1	*	*	*	*	*	855	344	2.03
	Northern Stargazer	1	*	*	*	*	*			
	Striped Searobin	2								
	Weakfish	4								
	Windowpane	1								
	Lined Seahorse	1								
9/88	Windowpane	4	19.0(s)	7.2(s)	8.8(s)	21.2(s)	506(s)	125	150	*
	Winter Flounder	1	19.0(b)	7.0(b)	6.1(b)	23.1(b)	504(b)			
6/89	No Fish	0	22.4(s)	7.2(s)	*	19.3(s)	350(s)	3102	1001	.40
			21.9(b)	8.1(b)	*	19.7(b)	360(b)			
7/89	No Fish	0	23.3(s)	7.4(s)	4.2(s)	24.9(s)	416(s)	3364	145	.48
			22.8(b))	7.3(b)	3.7(b)	25.7(b)	418(b)			
8/89	Winter Flounder	4	23.9(s)	7.9(s)	9.9(s)	25.1(s)	412(s)	737	0	.52
			23.4(b)	7.6(b)	6.7(b)	24.3(b)	422(b)			
9/89	Red Porgy	1	23.7(s)	7.9(s)	7.8(s)	22.5(s)	416(s)	*	*	.36
	Oyster Toadfish	1	23.6(b)	4.1(b)	5.6(b)	24.6(b)	424(b)			
	Summer Flounder	1								